THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XXV. OF VOL. I., 1940. LONDON, SATURDAY, JUNE 22, 1940. Pp. 88—Price 1s.
No. 6095. VOL. CCXXXVIII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS

SEE PAGE 2

Free to the Medical Profession on request. Cloth bound Ed. 5s.

ARTIFICIAL LIMBS.
"SOLVITUR AMBULANDO."
A Symposium on Prosthetic Achievement.
Pp. 72. 37 Coloured Plates.
"I congratulate you on this interesting, instructive, and artistic production. I consider it to be a very great addition to my library."—M.B., Ch.B., F.R.C.S.
J. E. Hanger & Co., Ltd., 7, Roehampton House, Roehampton, S.W.15.

In Two Volumes. SELECTED WRITINGS OF
JOHN HUGHLINGS JACKSON,
M.D., F.R.C.P., F.R.S.
I.—EPILEPSY AND EPILEPTIFORM CONVULSIONS.
II.—EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM: SPEECH: VARIOUS PAPERS: ADDRESSES AND LECTURES.
Edited by JAMES TAYLOR, M.D., F.R.C.P.
With the advice and assistance of GORDON HOLMES, M.D., F.R.C.P., and F. M. R. WALSHE, M.D., F.R.C.P.
Over 500 pages in each vol. Price 25s. net each; postage extra (inland 9d., abroad 10d.).
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

ANATOMY IN THE LIVING MODEL.
By DAVID WATERSTON, M.A., M.D., F.R.C.S.E., F.R.S.E.,
Bute Professor of Anatomy at the University of St. Andrews.
276 pages. 74 Illustrations. 16 Coloured Plates. Price 15s. net; postage 9d.
". . . can be read and re-read by the student, general practitioner, the surgeon and physician."
—ST. BARTHOLOMEW'S HOSP. JOUR.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

SEXUAL DISORDERS IN THE MALE.
BY KENNETH WALKER AND ERIC B. STRAUSS.
A manual for students and practitioners on the diagnosis and treatment of male sexual disabilities and deviations, including impotence and homosexuality.
Pp. xiv + 248. 9 Illus. 10s. 6d. net.
Hamish Hamilton Medical Books, 90, Great Russell-st., W.C.1.

PROBLEMS OF
ANÆSTHESIA
IN GENERAL PRACTICE.
By D. H. LUKIS, M.D., B.S.Lond.,
Late Hon. Anæsthetist, South London Hospital; late Clinical Assistant, Ear, Nose, and Throat Department, Queen's Hospital for Children; Hon. Medical Officer, Kingston Victoria Hospital.
Demy 8vo. 7s. 6d. net (postage extra). 158 + vi pages.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

PROGNOSIS. VOLS. ONE AND TWO
Price 10s. 6d. each net (postage 6d. each extra).
Companion Volumes to the "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis" Series.
The 124 articles of the series have been collected in book form in two volumes, which are fully indexed under titles, authors, and broadly classified into groups to facilitate quick reference.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

SECOND EDITION.
DISEASES OF THE RECTUM AND COLON
AND THEIR SURGICAL TREATMENT.
BY
J. P. LOCKHART-MUMMERY
F.R.C.S. ENG., M.A., M.B., B.CH. CANTAB.
Emeritus Surgeon to St. Mark's Hospital.
Pp. viii + 616, with 247 Illustrations. Price 35s.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

A NEW BOOK
INJECTION TREATMENTS
By PENN RIDDLE, B.S., M.D., F.A.C.S.
See Saunders' Advertisement on Page 5

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully illustrated. £3 3s. net.
"No praise is too high for the author of this great book. It must be considered as the standard work on thyroid disease. Its pages summarise all that is known of this most interesting subject at the present day."—WEST LONDON MEDICAL JOURNAL.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

3rd Ed., fully revised, 852 pp., 816 Illustrations.
EMERGENCY SURGERY. 50s. net; postage 8d.
By HAMILTON BAILEY, F.R.C.S.
Bristol: John Wright & Sons Ltd. London: Simpkin Marshall Ltd.

AN AYLESBURY BROADSIDE
Now Ready. From all Booksellers. Price 3d.
Setting out, from the medical standpoint, the grounds, social, economic and physiological, for the immediate grant of family allowances on a national scale.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

Second Revised Edition. 82 Illustrations. 30s. net.
CANCER OF THE BREAST
AND ITS TREATMENT.
By W. SAMPSON HANDLEY, M.S., F.R.C.S.
John Murray, Albemarle-street, W.

RADIOTHERAPY IN THE DISEASES OF WOMEN.
By MALCOLM DONALDSON, B.A. (Cantab.), F.R.C.S. (Eng.), M.B., Ch.B. (Cantab.)
Physician Accoucheur with Charge of Out-patients, St. Bartholomew's Hospital; Consulting Gynæcologist Royal Northern Hospital, &c.
Demy 8vo. 148 pages. 11 Illustrations in the Text; 2 Plates, one in Colour. Price 7s. 6d. net; postage 6d.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

Valuable Volumes ★ *J. & A. CHURCHILL LTD.* ★ *Modern Methods*

New (Second) Edition 62 Illustrations 15s.

RECENT ADVANCES IN SEX AND REPRODUCTIVE PHYSIOLOGY

By J. M. ROBSON, M.D., D.Sc., F.R.S.E., *Lecturer in Pharmacology, University of Edinburgh*

A SHORT TEXTBOOK OF SURGERY
By C. F. W. ILLINGWORTH, M.D., F.R.C.S. Ed. *Second Edition.*
12 Plates and 189 Text-figures. 24s.

PHYSICAL TREATMENT:
By Movement, Manipulation and Massage
By JAMES MENNELL, M.D., B.C. *New (Fourth) Edition.*
281 Illustrations. 25s.

MEDICAL ORGANISATION AND SURGICAL PRACTICE IN AIR RAIDS
By PHILIP H. MITCHINER, C.B.E., T.D., M.D., M.S., F.R.C.S., and E. M. COWELL, C.B.E., D.S.O., T.D., M.D., B.S., F.R.C.S.
51 Illustrations. 10s. 6d.

SURGICAL ANATOMY
By GRANT MASSIE, M.S., F.R.C.S. *New (Fourth) Edition.*
158 Illustrations, many in Colour. 21s.

104 GLOUCESTER PLACE, LONDON W.1

LIBRARY OF CONGRESS JUL 20 1940 DIVISION

NEUROSES IN WAR TIME

ELIXIR GABAIL

. . . . . allays anxieties, doubts and fears, and relieves mental stress engendered through heightened tension and increased nervous strain.

Dose: One tablespoonful twice or thrice daily

Supplied in bottles of 187 c.c. and in bulk for Hospital use

THE ANGLO-FRENCH DRUG CO. LTD., 11 & 12, Guilford Street, LONDON, W.C.1

A TOAST:

"HERE'S TO OUR FRIENDS! AS TO OUR FOES, MAY THEY HAVE SHORT SHOES, AND CORNS ON THEIR TOES."

Composed by LORD PALMERSTON and told by him to MR. DOWIE in 1852

Marching Boots, and all forms of Service footwear, built to measure, or supplied from stock, are offered at prices which represent good value.

Surgical and Corrective Department. Prescriptions are intelligently carried out by fitters and makers who enjoy a world-wide reputation for this specialised class of work. Full details of D & M's productions and service will be sent upon request.

DOWIE & MARSHALL LIMITED (CIVIL, MILITARY AND SURGICAL CORDWAINERS, POSSESSING 116 YEARS' REPUTATION)

16, GARRICK STREET, COVENT GARDEN, W.C.2

INCORPORATING A. MISTEL & SON TEMPLE BAR 5387

D&M LONDON 1824

Valentine's Meat-Juice

IN Vomiting of Pregnancy, in the Exhaustion following Haemorrhage or Prolonged Labour, and before and after Abdominal Operations, the Ease of Assimilation and Power of Valentine's Meat-Juice to Restore and Strengthen has been Demonstrated in

Hospitals for Women

The quickness and power with which Valentine's Meat-Juice acts, the manner in which it adapts itself to and quiets the irritable stomach, its agreeable taste, ease of administration and entire assimilation recommend it to physician and patient.

Physicians are invited to send for Clinical Reports.

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY

JB 96 **RICHMOND, VIRGINIA, U.S.A.**

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6095 LONDON: SATURDAY, JUNE 22, 1940 CCXXXVIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Muscle Lesions Simulating Visceral Disease. By J. B. HARMAN, M.R.C.P., and R. H. YOUNG, F.R.C.S. 1111

Thickened Ligamenta Flava in Low Back-ache and Sciatica. By W. E. CARNEGIE DICKSON, F.R.C.P.E., and R. J. TWORT, M.B. (*illus.*)... 1113

Chronic Meningococcal Septicæmia associated with an Outbreak of Cerebrospinal Fever. By Col. ARNOLD W. STOTT, F.R.C.P., and Major W. S. C. COPEMAN, F.R.C.P. (*with charts*) 1116

Tropical Macrocytic Anæmia in an Indian treated with Anahæmin. By N. HAMILTON FAIRLEY, F.R.C.P. (*with chart*) .. 1118

Serous Pleural Effusions. By J. M. VAIZEY, M.R.C.P., and KENNETH M. A. PERRY, M.R.C.P. 1120

Improved Outlook in X-Ray Carcinoma. By W. SAMPSON HANDLEY, F.R.C.S. 1122

Conservation of a Useful Thumb after Complete Phalangeal Necrosis. By Prof. ARNOLD K. HENRY, F.R.C.S.I. (*illus.*) 1123

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE: Section of Therapeutics and Pharmacology: Sulphathiazole in Staphylococcal Infections 1124

IN ENGLAND NOW

Commentary from our Peripatetic Correspondents 1136

LEADING ARTICLES

ANTITOXIN IN THE TREATMENT OF GAS GANGRENE 1127

WOMEN AND THE SERVICES 1128

IS VITAMIN C STABLE? .. 1128

SOLDIER'S DOCTOR 1129

ANNOTATIONS

Saccharin's Opportunity. 1130

Migration of Children.... 1129

Polyps of the Colon and Rectum..... 1130

The Ray Fungi..... 1130

What to Eat in War-time. 1131

Lord Moynihan 1131

Experiments on Soil Fertility 1132

Research on Wound Healing 1132

For. Mem. R.S. 1132

REVIEWS OF BOOKS

Religion in Science and Civilisation. By Sir Richard Gregory, F.R.S. 1125

Field Ambulance Organization and Administration. By Lieut.-Col. James Hardie Neil..... 1125

Theory and Treatment of Fractures of the Jaws in Peace and War. By H. H. Boyle, L.D.S..... 1126

Handbook of Skin Diseases. By Leon H. Warren, M.D. 1126

Chirurgie réparatrice et correctrice. By L. Dufourmentel 1126

Medical Annual, 1940. Edited by H. Letheby Tidy, F.R.C.P., and A. Rendle Short, M.D..... 1126

Synopsis of Regional Anatomy. By Prof. T. B. Johnston, M.D. .. 1126

THE LANCET 100 Years Ago 1140

SPECIAL ARTICLES

An Exercise in A.R.P.: Fixed First-aid Posts—Mobile Units—A.R.P. Units in Action—Rescue and Demolition—First-aid Dressing-station—Work of the Medical Officer—Grouping the Casualties (*with map*).. 1133

Medicine and the Law: Standards of Insanity—Guilty of Criminal Abortion 1135

LETTERS TO THE EDITOR

A.R.P.: Where the G.P. Comes In (Dr. George C. F. Roe and another) 1143

X-Ray Flying Squads (Dr. James F. Braidford and others) 1143

The Latent Period in Carcinogenesis (Dr. John W. Orr) 1143

Sulphathiazole (Dr. N. Howard Jones)..... 1144

Treatment of Cerebrospinal Fever (Dr. H. Stanley Banks) 1144

A Call for Help' (Lady Hutchison) 1145

Soldier's Doctor..... 1145

PARLIAMENT

On the Floor of the House 1138

From the Press Gallery: Civil Defence—Evacuation and Hospital Services 1139

Question Time: Unsafe Milk—Rural Sanitary Services—Danger of Water Pollution—Badges for Blood Donors—Special Diets for Invalids—Colonial Research—Visits to Soldiers in Hospital—An Unsubstantiated Claim. 1140

OBITUARY

Robert Fortescue Fox, F.R.C.P. (*with portrait*). 1141

Alfred Richard Denis Pattison, F.R.C.S. (*with portrait*)..... 1142

Thomas George Doughty Bonar, F.R.C.S.E..... 1142

PANEL AND CONTRACT PRACTICE

Interned Practitioners—Essex Public Medical Service 1123

PUBLIC HEALTH

From the School Reports. 1137

Infectious Disease in England and Wales..... 1137

MEDICAL NEWS

University of Cambridge. 1146

Royal College of Surgeons of England..... 1146

Orthopædic Clinics in Scotland..... 1146

General Medical Council.. 1146

Irish Medical Union..... 1146

Addendum to the British Pharmacopœia 1140

Lady Tata Memorial Grants 1142

Royal College of Surgeons in Ireland..... 1148

NOTICES

Birth Trauma among Primitive Peoples. By C. A. H. WATTS, M.H.. 1147

Make-Believe 1148

Medical Diary—Births, Marriages and Deaths.. 1145

Appointments 1146

Make the most of your Codex • ***Prescribe B.P.C. Preparations***

Combine the drug you wish to administer with ingredients of proved therapeutic value and get the thoroughly well-balanced preparation you desire.

KEEP THE CODEX HANDY • PRESCRIBE B.P.C. PREPARATIONS

The British Pharmaceutical Codex 1934. Price 35/- net.

Postage abroad 2/6 extra.

THE PHARMACEUTICAL PRESS :: 17, Bloomsbury Square, London, W.C.1

OXFORD MEDICAL PUBLICATIONS

Some Press Comments :—

THE EMOTIONAL FACTOR IN VISCERAL DISEASE

By **H. G. McGREGOR**, M.D., M.R.C.P.

"A book the consultant as well as the practitioner can study with profit."—*Clinical Journal*

Pp. 210 — 4 Illustrations — **8s. 6d.** net

MEDICAL PRACTICE IN RESIDENTIAL SCHOOLS

By **F. G. HOBSON**, M.D., F.R.C.P.

"A book which no school medical officer should be without."—*British Journal of Children's Diseases*

Pp. 300 — 8 Illustrations — 3 Colour Plates — **10s. 6d.** net

HEART DISEASE AND PREGNANCY

By **CRIGHTON BRAMWELL**, M.D., F.R.C.P., and **E. A. LONGSON**, M.B., Ch.B., D.P.H.

"Of inestimable value alike to general practitioner, obstetrician, and cardiologist."
—*Journal of Obstetrics and Gynæcology*

Pp. 206 — 57 Illustrations — **8s. 6d.** net

A TEXT-BOOK OF NUTRITION

By **J. A. NIXON**, C.M.G., M.D., F.R.C.P., and **D. G. C. NIXON**, M.B., B.S.

"Supplies the need for a well-balanced general introduction to the modern conception of nutrition and dietetics."—*The Lancet*

Pp. 230 — 9 Figures — **7s. 6d.** net

THE EARLY DIAGNOSIS OF MALIGNANT DISEASE

By **STANFORD CADE**, F.R.C.S., **MALCOLM DONALDSON**, F.R.C.S., F.R.C.O.G., **A. TUDOR EDWARDS**, M.D., F.R.C.S., **W. DOUGLAS HARMER**, F.R.C.S., and **R. OGIER WARD**, F.R.C.S.

"The authors are to be congratulated for the excellence of their work, and for packing so much vital information into so small a space."—*British Medical Journal*

Pp. 174 — **8s. 6d.** net

X-RAY INTERPRETATION

By **H. CECIL H. BULL**, M.B., M.R.C.P.

"A book that fills a definite gap . . . we have no hesitation in recommending it."
—*British Journal of Radiology*

Pp. 412 — 280 Illustrations — **21s.** net

A PRACTICAL MANUAL OF DISEASES OF THE CHEST

By **MAURICE DAVIDSON**, M.D., F.R.C.P.

"The most useful book on its subject that has appeared for many years."
—*Bristol Medico-Chirurgical Journal*

Pp. 540 — 199 Illustrations — 1 Colour Plate — **42s.** net

LEGGE'S INDUSTRIAL MALADIES

Edited by **S. A. HENRY**, M.D., D.P.H.

"Should be in the hands of every medical man engaged in the health inspection of factory workers."
—*The Lancet*

Pp. 247 — 13 Illustrations (2 in Colour) — **12s. 6d.** net

DYSMENORRHŒA

By **ALBERT A. DAVIS**, M.D., Ch.M., F.R.C.S.

"The best work available concerning dysmenorrhœa."—*The Practitioner*

Pp. 266 — 34 Illustrations — 1 Colour Plate — **12s. 6d.** net

COMMON HAPPENINGS IN CHILDHOOD

By **Sir FREDERIC STILL**, K.C.V.O.

"There is none whose experience is so great that he will learn nothing from this."
—*Glasgow Medical Journal*

Pp. 188 — **5s.** net

Oxford University Press

ADDRESSES AND ORIGINAL ARTICLES

MUSCLE LESIONS SIMULATING VISCERAL DISEASE

By J. B. HARMAN, M.D. Camb., F.R.C.S., M.R.C.P.
PHYSICIAN TO OUTPATIENTS AT ST. THOMAS'S HOSPITAL, LONDON; AND
R. H. YOUNG, F.R.C.S.
MEDICAL OFFICER TO PHYSIOTHERAPEUTIC DEPARTMENT AT THE HOSPITAL

"RHEUMATIC" lesions of the deep muscles of the back often cause pain referred to the front of the body which simulates other diseases. In the past eighteen months we have treated twenty-four patients in whom this cause of pain had been overlooked. Most of them came with a definite diagnosis of some visceral disease, but this was excluded, and cure or relief by treatment by local anæsthesia or by massage proved that deep muscle lesions were responsible for the pain.

PATHOLOGY

The localisation of deep pain has been studied (Kellgren 1939, Lewis and Kellgren 1939) by injecting small quantities of hypertonic saline into various structures. A deep injection into the back gives a dull ache which diffuses throughout the corresponding spinal segment so that it is sometimes more noticeable in the front of the body. This front pain is accompanied by hyperalgesia of the skin and by tenderness, rigidity, and sometimes spasm of the muscles. It is to be remarked that all these phenomena, which in the abdomen are recognised as signs of visceral disease, can be produced equally well by damaging the muscles and ligaments of the back. In our cases it was possible to perform the reverse experiment—i.e., to abolish these phenomena by injecting procaine into the back—and, since it is easy to tell where the point of a needle is, it could be shown that the irritating focus was in muscle or fascia and not in joint, bone, or ligament.

Although the pathology of these muscular lesions is unknown, the natural history of the affection is similar to that variously known as "fibrositis," "muscular rheumatism," and "myositis," which in special situations may give the syndromes of brachial neuritis, lumbago, sciatica, and so on. All these affections have certain features in common. For example, some persons are unusually prone to them and suffer in their lifetime from several manifestations. This was a common complaint in our patients, and while under treatment for abdominal pain one patient also had sciatica and another patient had brachial neuritis. Whatever form the attacks may take they are all liable to be aggravated by damp and strain and are all relieved by the same treatment. Hence there is some reason to believe that the lesions causing these pains may have a similar pathology.

Though we cannot define any further the intimate nature and ætiology of these lesions, it is still possible to disprove certain other hypotheses. For instance, the lesion is not a neuritis in the sense of an inflammation of nerve trunk. Irritation of a nerve gives pain referred only to the peripheral distribution of its contained fibres. Since our patients felt pain in the abdomen or in the chest, any neuritis must have been in the main trunk of a spinal nerve or in its anterior division. Either of these parts would have to be anæsthetised to relieve a neuritic pain, because the pain impulses must be blocked central to their point of origin. This could not have happened in our cases, because both the anterior division and the main trunk were out of range of the needle, which lay in the deep muscles of the back.

The association of chronic abdominal pain with spinal osteo-arthritis has led to the suggestion that the pain is referred along a nerve that is nipped by osteophytes, or from the pathological joint. But osteophytes were present in only a few of our cases, and even in these the effect of infiltrating the muscles shows that no pathological change of the nerve in the intervertebral foramina could have been responsible for the pain. For the same reason it can be said that neither were the joints directly responsible for the pain in our cases, though this may be the cause in others. This question of osteoarthritis is of more than purely academic importance because, if a normal radiogram is allowed to exclude the suspicion that an abdominal pain was referred from the back, then the commoner, younger, and more easily treated cases will be overlooked.

The vast majority of patients with painful lesions in the back localise their pain accurately and complain simply of backache, and it is only relatively few who feel their pain in the front or the sides. Now, if the pathology of these muscle lesions is the same in the two cases as we have suggested, then some explanation is required of the difference in localisation. First, the usual site of backache is the small of the back or over the sacrum, which segments have no abdominal component; therefore pain in them can only be diffused into the buttock and down the leg, causing lumbago and sciatica. The only parts of the back from which an abdominal pain can arise are the last five or six thoracic segments, and these appear to be less susceptible to muscle lesions than those lower down. This distribution of the lesions explains the comparative rarity with which they give abdominal pain but not the fact that even in the lower thorax they often cause backache only. Kellgren (1939) has shown that the accuracy of localisation of experimental pains depends on the depth of the saline injections. A superficial injection is felt at the site of injection, but a deep injection is poorly localised and the pain is felt anywhere in the corresponding segment. This would be a satisfactory explanation of the differences observed clinically, though it has not proved possible to measure the depth and position of the natural lesions with sufficient accuracy to confirm the supposition. It is, however, possible to produce at will a backache by a superficial injection of saline or, by a deeper injection, to give a pain which the patient recognises as having the same distribution and quality as his symptoms.

SYMPTOMS

The referred pain is a dull internal ache; it is usually mild and persistent, though occasional sharp twinges may produce a catch in the breath and keep the patient quiet and wary for the next few minutes. The severest pains are described as grinding or bursting, and after half an hour or so they may leave the patient sweating and shaken, with the conviction that something is very wrong inside. Occasionally there is nausea. As might be expected with a muscle lesion, the pain is related to movement and position. Often patients have discovered for themselves the movement that brings on a twinge, such as carrying a bag or reaching for books off a shelf. This sudden stimulation of the lesion by movement commonly exaggerates the pain momentarily, so that a mild dull ache is punctuated by sharp pains stabbing round the body into the front. This series of events is often mistaken for renal colic when it occurs in the appropriate segment, and the similarity was made even greater in one of our patients with a lesion in the lateral abdominal muscles, who complained of an aching in the right testicle which died away slowly after the attacks. More usually the pain is only made worse after some position has been maintained for a time, such as lying in bed or driving a car. In this event there will be little more than a dull soreness in the abdomen and no shooting pains to connect it with the mild discomfort in the back; hence conditions such as chronic appendicitis are commonly suspected.

Patients will often adopt curious attitudes for the relief of this type of pain, such as sleeping with a pillow under the buttocks or with the arms outstretched in the crucified position to prevent "angina," while it is common to hear that they cannot sleep on one side owing to the pain "dropping across" the abdomen. One woman with a supposed ulcer dyspepsia was constantly disturbed by pain half an hour after she went to bed; it was dispersed by movement or by sipping hot water, but by the water only if she had to walk to the bathroom to get it. Sufferers from persistent pains show that restless seeking after a comfortable position that is so characteristic of those who have brachial neuritis or sciatica.

Maintenance of posture tends to excite pain more often than does movement, but the effect of movement is more helpful in diagnosis, for it is more immediate and obvious. Gentle exercise may ease a pain where the muscles have stiffened up, but pain will be worse after too strenuous exercise has been taken. Mild cases may persist for months or years with only slight variations corresponding to the state of health or the weather. Infections, such as tonsillitis and influenza, are particularly liable to stir up a weak spot.

Reflex muscular spasm appears to cause special symptoms which may be distinguished from the effects of pain. In one patient the knotted abdominal muscles produced a palpable tumour which was thought to be a movable kidney, because it appeared in the groin and moved slowly towards the front during an attack of pain. In another, diagnosed as intermittent intestinal obstruction, the whole of the left side of the abdominal wall went into spasm, pushing the viscera to the right, so that the patient said that his stomach blew up when an attack of pain came on. It has been suggested (Lewis and Kellgren 1939) that the sensation of strangling in angina pectoris is due to muscle spasm, and we have heard this symptom complained of by a man with lesions in the supraspinati muscles. We suspect that spasm is also responsible for the sense of constriction in the lower chest and the compulsion to take great sighing breaths or to breath "gingerly" which accompanies it, whereas the same feeling in the abdomen makes the patient "want to hold the muscles" or "grip something and stretch." Cutaneous hyperalgesia is fairly common and, though it is not very painful, it tends to persist and may be annoying enough to make a woman loosen her clothes.

Since these muscle lesions are so common, it is not surprising that they sometimes accompany unrelated visceral disease. When the troubles are in different parts of the body they are not confused; but, even when both affect the same spinal segment, it is sometimes possible to distinguish the muscle pain merely by its dependence on position and movement. We have seen one patient with a gastric ulcer and typical pain who also had a constant stitch under the right costal margin which caught him sharply when he twisted round. This was abolished by infiltration of the back with procaine. Another patient was diagnosed as colitis due to chronic appendicitis; she had a genuine colitis, but the supposed appendicitis was a muscle pain referred to the right iliac fossa and was successfully treated as such. A third had a supposed pleurisy complicating silicosis.

MUSCLE LESIONS SIMULATING VISCERAL DISEASE

Sex	Age	History and clinical findings	Treatment and result
F	38	Pain left iliac fossa 8 months, back lesion at Th. 11	Massage and injection; 10 months' complete relief
F	24	Pain left hypochondrium 1 month, back lesion at Th. 9	Injection and exercises; 1 year's complete relief
F	53	Epigastric pain 5 months, back lesion at Th. 6–7	Two injections; 18 months' complete relief
M	49	Left-sided abdominal pain 2 months, extensive back lesions and osteo-arthritis	Injections; temporary relief only
M	25	Pain right hypochondrium 1 month, back lesion at Th. 9	One injection; complete relief
F	37	"Chronic appendicitis" 18 months and colitis, back lesion at Th. 11	Pain relieved much by one injection for 5 months; reinjection two months ago gave complete relief, colitis unaffected
F	16	"Chronic appendicitis" 6 months	One injection into back at Th. 11; complete relief
M	60	"Angina pectoris" intermittently 3 years, lesions in pectoral and scapular muscles	Three injections; complete relief one year
M	52	"Coronary thrombosis"; pain 8 hours	One injection into intercostals at Th. 4; instant complete relief
F	30	"Chronic salpingitis" left side intermittently 5 years	One injection in back at Th. 11–12; complete relief
M	40	"Chronic cholecystitis" intermittently 5 years	One injection at Th. 8–9; complete relief
F	56	"Cholecystitis" 1 month	Infiltration of upper part of right rectus abdominis; complete relief
M	42	"Cholecystitis" 3 months complications proved gastric ulcer	One injection in back at Th. 8; complete relief
M	64	"Carcinoma of colon with obstruction" 4 months, extensive back lesions with osteoarthritis	Massage and heat; slight temporary relief
F	60	"Hydronephrosis" 5 months	One injection in back at Th. 12; complete relief 14 months
F	53	"Dietl's crises" 1 month	One injection in back at Th. 12; complete relief
F	48	"Pyonephrosis" 2 weeks	One injection in back at Th. 12; complete relief 11 months
M	47	"Renal pain" 2 months	Tender points in internal oblique muscles injected; complete relief
M	30	"Renal pain" 3 months	One injection in back at Th. 12; complete relief 2 months
F	26	"Renal pain" 5 months, since confinement	One injection in back at Th. 11; complete relief
F	34	"Renal pain" 8 years	Injection in back at Th. 10–11; complete relief 10 months
M	60	"Renal colic" 4 years	Two injections in back at Th. 10; complete relief
M	46	Silicosis and pleuritic pain 2 months	Injection in pectorals; complete relief of pain 6 months
F	30	"Appendicitis" 1 month	Two injections in back at Th. 12; complete relief 10 months; sudden recurrence relieved by another injection

EXAMINATION

The object of the physical examination is to discover the painful focus, to reproduce the symptoms by stimulating it, and to abolish them by anæsthetising the focus with procaine. The patient's description of his pain sometimes indicates fairly accurately which muscle is affected, and this can be confirmed by getting him to go through set movements which bring various groups of muscles into action or put them on the stretch. For example, a supposed angina of effort, which came on whenever a man walked briskly enough to swing his arms, could be reproduced easily by getting him to press his palms together and a supposed renal colic could be precipitated just when the abdominal oblique muscles contracted as the patient rolled from the supine to the prone position. The exact spot must be sought for by firm pressure with the thumb, and the area of skin under which tenderness can be elicited is commonly about the size of half a crown. Several such spots may be found, but the one responsible can only be in the same spinal segment and on the same side of the body as the symptoms. Even a correct anatomical position does not mean that any given tender spot is responsible for the abdominal pain, because it may be a mere coincidence and unrelated to the symptoms; it is therefore necessary to demonstrate a relationship by making the symptoms either better or worse. Deep pressure on a suspected spot usually causes such acute pain locally that the patient notices nothing else. Sometimes, however, a stabbing twinge to the front results, or, more convincing still, the patient says that the abdominal pain is made worse and feels as if it were being "pushed through to the front." The response

obtained depends to some extent on the original symptoms, and in mild cases often nothing more than the back pain will be admitted even on direct questioning. A more certain way of showing that the back pain is the cause of the symptoms is to abolish it with procaine. The patient should then be able to perform those movements which before were prevented by pain ; or, in those cases where the effect of posture was more important, they should be free from pain as long as the local anæsthesia lasts. Rigidity of the abdominal muscles disappears quickly, but cutaneous hyperalgesia tends to remain during the period of an ordinary consultation.

TREATMENT

The diagnostic injection of procaine may produce a complete and permanent cure. The technique is as follows :—

The tender spot is marked on the surface with a grease pencil. The skin is anæsthetised, and a long fine needle is pushed slowly into the deeper tissues. Its passage is painless until an acutely tender spot is struck, which should be promptly infiltrated with a few minims of a ½ or 1 per cent. solution of procaine. Other tender spots are then sought for and anæsthetised until all tenderness is abolished ; 5–10 c.cm. is generally required. The patient is warned that there may be a temporary return or exacerbation of the pain some hours after the injection. This is probably due to the acidity of the procaine, for it is uncommon when dilutions of 1 per cent. or less are used.

This is such a simple procedure that it is worth repeating at least three times at intervals of a few days if the first attempts are not entirely successful. Infiltration with procaine is impracticable in patients with very extensive lesions ; these are better treated by massage and exercises. The massage should be performed by rubbing the skin and subcutaneous tissues against the affected muscle, and it is bound to be painful at the time. Exercises to recover strength and mobility are useful in dealing with a slight residual pain. They are particularly important when there is any postural deformity, for this in itself may determine the site of an acute attack or, being a habit resulting from chronic pain, may set up a vicious cycle. To prevent these relapses we give instruction in remedial exercises in every case which is of long standing or where there is any abnormality of posture. We have not found that light massage or the various forms of radiant heat give any permanent relief in the rather chronic cases which are under consideration. They are, however, comforting at the time and are sometimes useful in winning the confidence of those timorous or sceptical patients who are apt to regard immediate injection as a painful assault and to excuse themselves from further visits.

DISCUSSION

It is common knowledge that disease of structures of the back, such as Pott's disease, carcinomatous deposits in the spine, and osteo-arthritis, may cause pain in the abdomen, because the disease will sooner or later become obvious. But muscle lesions will be missed completely if not thought of, because they never declare their presence by disablement or death, and there is not even an abnormal radiogram to suggest a diagnosis. They will be wrongly diagnosed or looked back on merely as obscure pains which came and went and caused no harm. Nevertheless they have been recognised before as mimics of angina pectoris and headache, and doubtless many practitioners have their own experience of similar traps in diagnosis. From our own cases we can point to the imitation of carcinoma of the colon, hydronephrosis, chronic appendicitis, and so on ; but there is no point in extending this list of errors that have or could be made. The lesions affect various muscles, and the pain may be diffused to almost any part of the body, yet they have their own peculiarities and natural history, and it is better to regard the syndrome as more characteristic of itself than of a host of other diseases with which it may be confused.

SUMMARY

(1) Twenty-four cases, summarised in the accompanying table, have been collected in which an affection of the back caused pain in the front of the abdomen and chest and led to an erroneous diagnosis of visceral disease.

(2) The mechanism of this false localisation is discussed in relation to recent work on deep pain sensation.

(3) The lesions are shown to have been in muscles, and it is suggested that they were similar to " rheumatic " affections.

(4) The pain and its usual variations and associated phenomena are described, and it is held that the syndrome is sufficiently characteristic to suggest a correct diagnosis. This can be confirmed by discovering the muscle lesion responsible.

(5) Treatment is effective enough to make it an essential part of the diagnosis ; it consists of infiltrating the lesions with procaine, supplemented by massage and exercises.

REFERENCES

Kellgren, J. H. (1939) *Clin. Sci.* **4**, 35.
Lewis, T. and Kellgren, J. H. (1939) *Ibid*, p. 47.

THICKENED LIGAMENTA FLAVA IN LOW BACK-ACHE AND SCIATICA

BY W. E. CARNEGIE DICKSON, M.D., B.Sc. Edin., F.R.C.P.E.
PATHOLOGIST AT THE WEST END HOSPITAL FOR NERVOUS DISEASES, LONDON ; AND

R. J. TWORT, M.A. Camb., M.B. Aberd.
FORMERLY RESIDENT MEDICAL OFFICER AT THE HOSPITAL

FIBROTIC thickening, hyperplasia, or, as it is sometimes rather loosely called, hypertrophy, of the ligamenta flava (subflava in the older terminology), with compression of the cauda equina, was first described by Elsberg, of New York, in 1913. The study of low back-ache with or without sciatica has aroused much interest in America, and attention has been focused on intraspinous lesions of the intervertebral disk (with its nucleus pulposus) and of the ligamentum flavum. In this country, although protrusion or herniation of the intervertebral disk into the vertebral canal is now being recognised more often, little attention has yet been paid to abnormalities of the ligamentum flavum. Either condition must be suspected in low back-ache and/or sciatica not responding to ordinary forms of therapy, and the conditions sometimes coincide. There have now been many reports of rapid relief of symptoms after laminectomy and removal of thickened ligaments.

CASE-RECORD

A male rent-collector, aged 35, was admitted to hospital under Dr. Colin Edwards on Jan. 4, 1940, with left sciatic pain of six months' duration. There had been an acute onset of low back-ache after unwonted use of a scythe. A few days later there was a burning pain down the back of the left thigh and calf. Left sciatic pain had persisted almost continuously since then and had resisted treatment by rest and physiotherapy. Pain was to some extent relieved by rest in bed, was made worse by standing, walking, or lifting a weight, and had been aggravated by an epidural saline injection given at another hospital. There was no difficulty in micturition, and sexual power was normal.

The circumferences of the left thigh and left calf were half an inch less than those of the right side. Knee-jerks brisk and equal, plantar reflexes flexor, left ankle-jerk absent. No appreciable motor weakness in left leg, no sensory loss in leg and buttocks, no tenderness on pressure over the sciatic nerve, no pain or limitation of movement on

extending left knee with hip flexed. Movements of hip-joints and lumbar spine unrestricted, no scoliosis or any appreciable tilt of the spine to either side.

Radiography of the lumbar spine did not show any narrowing of the intervertebral spaces or other skeletal abnormality.

Lumbar puncture between the third and fourth lumbar vertebræ produced cerebrospinal fluid (C.S.F.) at a pressure of 150 mm. C.S.F., no evidence of spinal block being elicited. C.S.F., clear and colourless, contained 2 small lymphocytes per c.mm., a slight excess of globulin, and 120 mg. of total protein per 100 c.cm. Wassermann reaction and Meinicke clarification reaction (M.K.R.II) negative. Lange's colloidal-gold curve : 2 : 1 : 1 : 1 : 1 : 1/0 : 0 : 0 : 0 : 0 : 0. The large amount of total protein suggested an intraspinal lesion. Lipiodol 5 c.cm. was injected by high lumbar puncture between the first and second lumbar vertebræ. The anteroposterior view (fig. 1), taken with the patient prone on a tilting table at an angle of 40° showed a symmetrical constriction of the theca, beginning at the interspace between the fourth and fifth lumbar vertebræ.

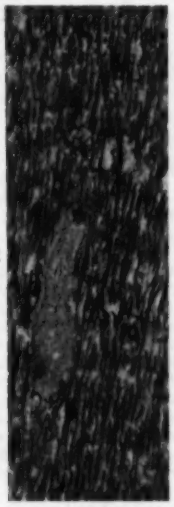
At operation by Mr. Geoffrey Knight on Jan. 15 the arches of the fourth and fifth lumbar vertebræ were removed, and great thickening of both right and left ligamenta flava between the laminæ of these vertebræ was found. The ligaments, which formed a single thickened transverse band, were tough and pale pinkish-red and had lost most of their normal yellow colour. The thickening or hyperplasia extended on both sides, partly encircling and compressing the immediately subjacent theca, the lateral prolongation being more pronounced on the left side. There was no evidence of any protrusion of an intervertebral disk. The thickened and coalesced ligaments were adherent to the subjacent dura, from which they were readily dissected, and after their removal the theca was opened to drain off the lipiodol.

The ligaments had been excised in three shred-like portions of firm, tough, pale reddish-white fibrous-looking tissue about 11 mm. long and 2·5–6 mm. thick. The fragment excised from the right portion of the ligament was comparatively normal (figs. 2 and 3), its elastic fibres being arranged in abundant regularly parallel bundles with only a minimum of fine collagenous connective tissue between them, both of these elements of the ligament being relatively non-cellular. Blood-vessels were scanty and mostly towards the surface. In this portion there were only a few small scar-like patches of fibrous connective tissue (fig. 2).

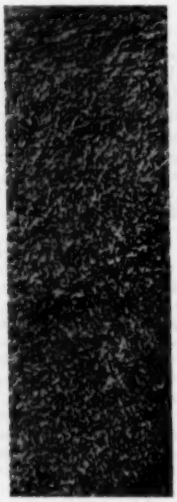
The more definitely thickened left-hand portion of the ligament showed an extensive mass of dense firm fibrous-tissue scarring (fig. 4). This cicatricial tissue was almost non-cellular but contained a few thickened blood-vessels with fibrous walls. In the elastic tissue adjoining this scar the fibres were irregularly thickened, many of them having abrupt or broken ends ; there were also numerous wisps and bundles of much thinner elastic fibres, many of them arranged like locks of curly hair (figs. 4 and 5). At first we were inclined to regard this as an attempt at repair of the elastic tissue, and it is possible that the appearances may be in part so interpreted ; but, especially in the corresponding transverse section (fig. 6), they are more consistent with thinning and degeneration in the damaged fibres, with the thicker remnants of which they are directly continuous, both being embedded in the dense scar-tissue.

FIG. 1—Anteroposterior radiogram of lumbar spine after intrathecal injection of lipiodol 5 c.cm.

In some of the intermediate areas, where the results of the injury have been less—e.g., round the small scar illustrated in fig. 7—the elastic fibres tend to lose their regular parallel arrangement and to form a network, and we suggest that this photomicrograph illustrates a criss-cross reparative "darn" of a slight tear in the ligament.



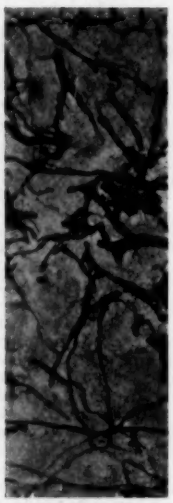
2—Longitudinal section of an almost intact portion of ligamentum flavum. (Mallory's connective-tissue stain.) (× 100.)



3—Transverse section corresponding to fig. 2, showing normal regular arrangement of elastic fibres. (Verhoeff's elastic-tissue stain.) (× 100.)

4—Longitudinal section of the margin of the main area of hyperplastic scar tissue. (Verhoeff.) (× 100.)

5—Higher magnification of section shown in fig. 4 at edge of scar, showing thick fragmented fibres and thin wisps of (?) degenerating fibres. (Verhoeff.) (× 400.)



6—Transverse section at margin of same scar as in fig. 4, showing that the thin fibres appear to be degenerating rather than regenerating. (Verhoeff.) (× 400.)

Comparison of the regularity in the arrangement of the fibres shown in the longitudinal and transverse sections of the more normal part of the ligament (figs. 2 and 3) with the irregularly fractured and thickened fibres (figs. 4–6), often with the thin and more faintly staining fibres in direct continuity with them, suggests attenuation and degeneration rather than regeneration.

Convalescence, except for some difficulty in micturition for the first two days, was uneventful. There was immediate relief from pain in the left leg. Stiffness and limitation of movement of the back at the site of laminectomy were rapidly improving when the patient was discharged on Feb. 12 and have now completely disappeared. The left ankle-jerk had not returned.

ANATOMY AND PATHOLOGY

The ligamenta flava are composed normally of yellow elastic tissue and connect the laminæ of adjacent vertebræ. They also blend with the interspinous ligament and help to form the capsules of the intervertebral synovial joints, and their lateral or anterolateral edge forms the posterior margin of each intervertebral foramen, leaving a comparatively narrow space (fig. 8) for the outward passage of the nerve-roots, dorsal and ventral, which unite within the foramen to form the corresponding spinal nerve.

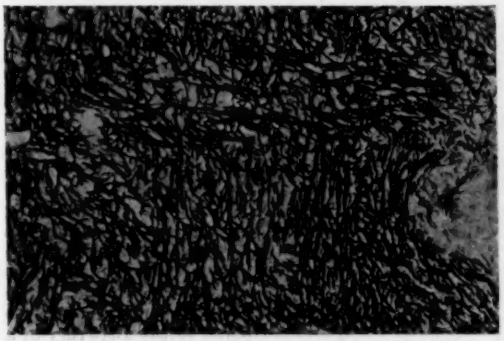
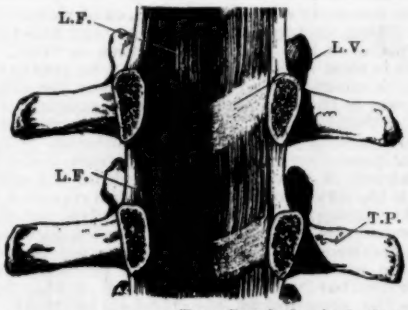


FIG. 7—Section of a small round fibrous scar, with a darn-like (?) repair of a neighbouring slighter tear. (Verhoeff.) (× 100.)

The foramen is shaped like an inverted pear, the nerve passing out through the upper or larger part of the opening, and the lower part being narrow or slit-like. For convenience in describing these ligaments, and although they are more or less continuous with one another across the middle line, anatomists usually regard each intervertebral interval as containing a pair of ligamenta flava, right and left (fig. 9). The normal ligaments are 2–3 mm. thick; they are the only predominantly elastic ligaments in the human body and, in virtue of their elasticity, can accommodate themselves to the separation and approximation of the laminæ in forward and backward flexion of the vertebral column. The forces at work, and consequently the strain, on this part of the body are considerable. Naffziger et al. (1938) call attention to the extraordinary resilience of the vertebral column associated with the cushion-like "turgor" of the intervertebral disks and the elastic retraction of the various ligaments, even apart from the action of the muscles; and they estimate that the various force-vectors at work—e.g., in lifting a 50 lb. weight—are multiplied about ten times, and sometimes, especially in sudden effort, to an even greater degree, with a resultant pressure upon the lower



From Cunningham's Anatomy.

L.F.=Ligamentum flavum. L.V.=Lamina of vertebra. T.P.=Transverse process.

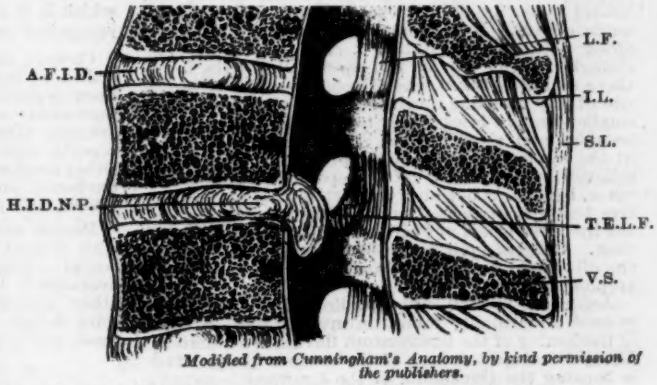
FIG. 9—Ligamenta flava seen from the front after the removal of the bodies of the vertebræ by saw cuts through the pedicles.

lumbar disks of some 500 lb. or more. Similarly, great strain is put on the ligamenta flava and the other vertebral ligaments. By their elastic tension the ligamenta flava help the posterior vertebral muscles to maintain the erect posture. Histologically they consist almost entirely of elastic fibres held together by a small amount of intervening collagenous or white fibrous tissue (figs. 2 and 3).

The elastic fibres of the ligamenta flava are normally under tension. Torn from their attachments or ruptured they contract and thicken; and acute or chronic trauma appears to cause the pathological thickening. Tears heal by the formation of scar tissue, and a ligament in which such changes have taken place may be 10 mm. or more in thickness and is usually adherent to the dura. This fibrotic hyperplasia may be unilateral or bilateral, the histological changes being a replacement of the normal yellow elastic tissue by collagenous white fibrous tissue in which there may be calcareous deposits. The site of election for the lesion is, as we have already stated, in the lower lumbar region, affecting most commonly the ligaments between the fourth and fifth lumbar vertebræ.

DIAGNOSIS

The symptoms of thickening of the ligamentum flavum are essentially the same as those of protrusion of an intervertebral disk, and by clinical examination alone it is rarely possible to differentiate between them. Adult males are predominantly affected.



Modified from Cunningham's Anatomy, by kind permission of the publishers.

A.F.I.D.=Annulus fibrosus of intervertebral disk.
H.I.D.N.P.=Herniation of intervertebral disk and its nucleus pulposus.
L.F.=Ligamentum flavum.
I.L.=Interspinous ligament.
S.L.=Supraspinous ligament.
T.E.L.F.=Thickened edge of ligamentum flavum.
V.S.=Vertebral spine.

FIG. 8—Median section through part of the lumbar spine, showing narrowing of an intervertebral foramen between the thickened edge of a ligamentum flavum and a herniated intervertebral disk.

There is usually a history of a fall, or of violent bending, lifting, or torsion of the spine, and the patient complains of low back pain, sciatica or both. The onset is most often sudden but may be gradual, and there is commonly an interval between the onset of the pain in the back and the pain of sciatic distribution. There may be motor weakness, numbness or sensory loss in the feet, legs or buttocks. Urinary incontinence is rare, but sexual impotence is common. An absent or diminished ankle-jerk on the affected side is the objective finding most often reported, with lumbar scoliosis and tilting of the pelvis, usually to the same side as the lesion, although sometimes to the opposite side. There may or may not be tenderness on pressure over the spinous processes of the lower lumbar vertebræ, tenderness of the sciatic nerve to pressure in the buttock or thigh, and limitation of flexion at the hip when the leg is straight.

Lumbar puncture should be carried out when neurological examination suggests the presence of a lesion within the vertebral canal or theca, or when the condition proves intractable to ordinary treatment. In fibrotic thickening of the ligamentum flavum, as in hernia of the intravertebral disk with protrusion of the nucleus pulposus, the total coagulable protein of the cerebrospinal fluid is commonly but not invariably raised above the normal upper limits of 25 to 30 or 35 mg. per 100 c.cm., these normal figures varying with the age of the patient. An obstructive lesion in the vertebral canal is characteristically associated with a rise in total protein in the fluid both above and below the lesion. If the lumbar puncture is made at or below the fourth lumbar interspace (the common site of obstruction in hyperplasia of the ligamentum flavum) a partial or complete spinal block may be demonstrated.

Epidural injection of saline is often valuable in doubtful cases. The injection of even a few cubic centimetres of saline will cause an exacerbation of pain if there is already any degree of compression of the cauda equina.

Myelography is essential for diagnosis. Opinions differ as to the quantity of iodised poppy-seed oil which should be used. With the patient in the erect posture, some 5 c.cm. is required to fill the lower spinal theca to the level of the third lumbar vertebra. This amount is therefore required in order to be sure of showing up any filling-defects due to protruded intervertebral disks or thickened ligamenta flava in the lower lumbar region, if diagnosis depends on straight films and cannot be assisted by fluoroscopy. Anteroposterior films with the patient prone, and lateral films, are taken with the tilting-table at an angle of 40°. If the fluoroscope can be employed along with a tilting-table, 2 c.cm. of oil may be enough, for this can be run up and down the lower theca and films taken when the oil is seen to be at the site of any notching or obstruction in the flow. The smaller amount is less likely to be followed by urinary troubles and arachnoiditis. Irritation of the roots of the cauda equina from the oil may sometimes be relieved by draining it off by repeated lumbar punctures, but this is not always effective. If an obstructive lesion is diagnosed and laminectomy performed the theca is opened at operation and the oil evacuated then. Otherwise, if myelography proves negative, the oil should be drained from the theca after sacral trephining.

According to Bell and Spurling (1938) the commonest abnormality found on myelography in cases of thickening of the ligamentum flavum is a unilateral filling-defect or notching of the column of oil. This is because the thickening of the ligament is usually predominantly unilateral. A similar defect is the common finding in cases of protrusion of an intervertebral disk. Myelography will not therefore always distinguish between these lesions, but fortunately the same surgical approach is required for both. When the thickening of the ligaments is bilateral a symmetrical hour-glass constriction of the dural sac and the enclosed column of oil is demonstrated, as in the case reported here. A complete hold-up of the oil is still more rare, both in protruded intervertebral disk and in hyperplasia of the ligamenta flava.

SUMMARY

A case of sciatica due to fibrotic thickening or hyperplasia (so-called hypertrophy) of the ligamenta flava in the lower lumbar region is described, and the anatomy and pathology of this lesion are explained.

We thank our colleague, Dr. Colin Edwards, for permission to use the clinical notes; Dr. Alexander Orley and Mr. A. York, the radiological assistant, for the radiogram, and Messrs. Charles Martin and Ronald Egan for technical assistance in the preparation of the microscopical sections and photographs.

REFERENCES

Bell, J. C. and Spurling, R. G. (1938) *Radiology*, **31**, 473.
Elsberg, C. A. (1913) *Surg. Gynec. Obstet.* **16**, 117.
Naffziger, H. C., Inman, V. and Saunders, J. B. de C. M. *Ibid*, 1938, **66**, 288.

CHRONIC MENINGOCOCCAL SEPTICÆMIA

ASSOCIATED WITH AN OUTBREAK OF CEREBROSPINAL FEVER

BY ARNOLD W. STOTT, F.R.C.P.

COLONEL, R.A.M.C.; CONSULTING PHYSICIAN TO THE BRITISH EXPEDITIONARY FORCE; AND

W. S. C. COPEMAN, M.D. Camb., F.R.C.P.,

MAJOR, R.A.M.C.; ASSISTANT PHYSICIAN, NO. 3 GENERAL HOSPITAL, BRITISH EXPEDITIONARY FORCE

THE meningococcus has long been familiar as the cause of cerebrospinal fever in epidemic and in sporadic form. Meningococcal meningitis is usually easy to diagnose, because the symptoms of an acute infection and of meningeal irritation lead at once to puncture of the spinal theca and to the discovery of a turbid cerebrospinal fluid in which the meningococcus is readily identified. The meningococcus is also well known as an inhabitant of the upper respiratory passages in some healthy people. Much less familiar in England is chronic meningococcal septicæmia, in which the meningococcus inhabits the blood-stream for weeks, months, or even years and causes an illness which is so characteristic that it should be as readily recognised as meningococcal meningitis.

Chronic meningococcal septicæmia was first described by Soloman (1902), and since then cases have been reported with increasing frequency from the Continent and, of recent years, from America. Dimson (1938) mentioned the scarcity of English reports and gave a clear picture of the disease. Other good accounts are those of Appelbaum (1937), Carbonell and Campbell (1938), Binns and Clancy (1939), and Heinle (1939).

Recent experience in France has led us to agree with several previous writers that chronic meningococcal septicæmia is not uncommon but is often overlooked because of a superficial resemblance to other conditions. The accompanying table gives some details of seventeen out of about twenty-seven cases which we have recently encountered.

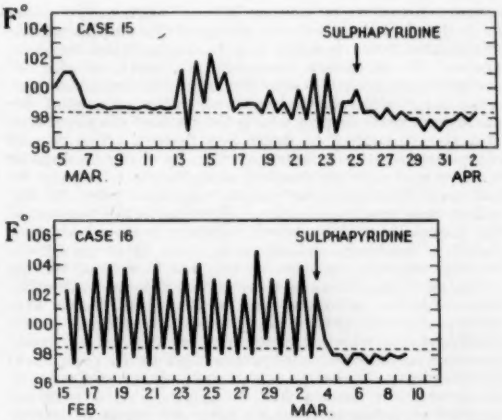
COMMENTS

Blood-cultures.—Although positive blood-cultures were obtained in only three cases in the series reported (and in a further two cases not included in this report), we have no doubt on clinical grounds that the remaining cases were chronic meningococcal septicæmia. Many authors allude to the difficulty of isolating the meningococcus from the blood, especially in the early

stages of the disease, and repeated cultures are often necessary for success.

Clinical diagnosis.—Although the isolation of the meningococcus from the blood is the only certain method of diagnosis, we believe that chronic meningococcal septicæmia is so characteristic that bedside diagnosis is simple. Early diagnosis is important; for, although the disease does not appear to be dangerous or to make the patient acutely ill, grave complications may arise at any time, especially after a few weeks. Early diagnosis is also important because sulphonamides are a prompt and effective remedy.

Clinical picture.—The onset is usually sudden, with fever, chilly feelings, or a rigor; severe headache; and severe migratory joint and muscle pains. Joint effusions are not uncommon. Within a few days the characteristic rash appears. Many different skin lesions have been described, and more than one type is usually found. The commonest lesions are pink or red macules, papules, and nodules varying from a few millimetres to 2 cm. or more in diameter. The papules and nodules are sometimes painful, and some of them were tender in sixteen out of the seventeen cases reported. On pressure the colour fades but a small central hæmorrhage can often be identified. Petechiæ are not uncommon. In six cases large lesions were present, often referred to as "blind boils." In a few cases there were tender subcutaneous nodules, especially on the front of the legs; in these the "tenderness of the shins" suggested trench fever. The rash is most profuse on the limbs and on the back of the trunk; fewer lesions are found on the chest, abdomen, and face. Successive crops appear, often with the rise of temperature, and each crop lasts for a few days, leaving a slight brownish discoloration. Skin



Temperature charts of case 15 and case 16 (see the accompanying table), showing different types of fever and rapid response to the administration of sulphapyridine in chronic meningococcal septicæmia.

CHRONIC MENINGOCOCCAL SEPTICÆMIA

Case	Age	Onset	Initial symptoms	Recurrent tender rash	Headache	Muscle and joint pains	Joint effusions	Type of fever	Afebrile periods	Duration of disease (weeks)	Blood culture	Throat culture	Leucocytes per c.mm.	Original diagnosis
1	19	Gradual	Sore throat and cold	+	+	+	0	Irregular, rising to 102° F.	+	?	1 neg. 1 pos. Gr. 1	Neg.	11,000 P. 68%, L. 21%	Erythema nodosum
2	21	,,	Joint pains	+	?	+	0	Ditto to 102·6° F.	+	3	1 neg.	,,	16,900 P. 73%, L. 21%	Rheumatic fever
3	28	,,	,, ,,	+	+	+	0	Intermittent to 103° F.	O.D.	8	2 neg.	,,	34,000 P. 70%, L. 25%	Arthritis
4	32	Sudden	Muscular pains and shivering	+	+	+	0	Irregular, rising to 101·6° F.	+	3	Not done	Not done	8000 P. 70%, L. 30%	Erythema nodosum
5	19	,,	Headache, rigors, "pains all over"	+*	+	+	+	Unknown, 100° F. on admis. then afebrile	+	2	1 neg. 1 pos. Gr. 1	,,	7000 P. 60%	Influenza
6	39	,,	Joint pains, sore-throat, redness and swelling of back of right hand, rigor	+	+	+	+	Intermittent to 100·6 F.	0	2	1 neg.	Neg.	24,000 P. 85%, L. 14%	Rheumatic fever with erythema marginata
7	25	,,	Rigor, sweating, muscular pains, sore-throat	+	?	+	0	Ditto to 103° F.	0	3	,,	,,	20,000 P. 87%	Rheumatic fever
8	35	,,	Rigor, sweating, muscular pains	+	+	+	+	Ditto to 101·6 F.	0	5	3 neg.	,,	16,000 P. 67%, L. 32%	,,
9	26	,,	Muscular pains, sweating, shivering	+	+	+	0	Irregular, rising to 102·6 F.	+	3	2 neg.	,,	7200 P. 72%, L. 25%	Acute myalgia
10	31	Gradual	Joint and muscular pains, sweating	+	+	+	+	Ditto to 102° F.	+	8	1 neg.	,,	6100 P. 69%, L. 28%	Subacute rheumatism
11	27	Sudden	Malaise, "painful lump on right leg," shivering and sweating	+	+	+	+	Intermittent to 104° F.	O.D.	3–4	3 neg.	,,	18,200 P. 84%	,,
12	30	Gradual	Malaise, anorexia, pains in legs	+	?	+	+	Irregular, rising to 101·2° F.	+	9	,,	,,	Not done	,,
13	20	,,	Pain and stiffness in limbs and back, rigor	+	+	+	0	Ditto to 102·4° F.	+	3–4	,,	,,	17,000 P. 78%	Rheumatic fever
14	32	Sudden	Rigor, "all joints ached"	+	+	+	0	Ditto to 103·2° F.	O.D.	?	1 neg. 1 pos. Gr. 1	,,	7000 P. 67%	Rheumatism, toxic erythema
15	42	,,	Shivering, sweating, pains in limbs	+	?	+	0	Irregular, rising to 102° F.	+	4	1 neg.	,,	16,600 P. 59%	Rubella
16	32	,,	Headache, pains back of limbs and back	+	+	+	0	Remittent to 105° F.	0	8	2 neg.	Pos. Gr. 1	12,700 P. 71%	Influenza
17	29	,,	Malaise, shivering, fever	+	?	+	0	Irregular, rising to 104·5° F.	+	4–5	1 neg.	Neg.	6400 P. 48%, L. 46%	,,

* No tender lesions. O.D.=Only for occasional day. Gr.=group.

lesions occasionally are scanty and then easily overlooked. If untreated with drugs of the sulphonamide group the fever persists for weeks, months, or even years. It is either intermittent, with a rise of temperature to 101°–105° F., or more irregular and relapsing, with short bouts of fever separated by afebrile periods during which the patient may feel well and be discharged to duty (see figure). The rise of temperature may be accompanied by chilly feelings or a rigor and a fresh crop of skin lesions; it may be followed by a profuse sweat. In two patients the spleen was easily palpable. A remarkable feature of the disease, noted by several writers, is the absence of debility, wasting, and anæmia, even after an illness lasting many months. The chief complications reported in the literature are meningitis and infective endocarditis; nephritis and acute epididymitis also occur. In our series one patient developed acute epididymitis, which disappeared rapidly with sulphapyridine treatment; one patient had a mild peripheral neuritis in the legs with loss of ankle-jerks and sensory disturbances; and a few complained of a residual painful stiffness of muscles after all signs of active infection had disappeared. Two patients with cerebrospinal fever gave a history strongly suggesting that they had had chronic meningococcal septicæmia for 2–4 weeks before the onset of meningitis.

Differential diagnosis.—The commonest original diagnoses were rheumatic fever or subacute rheumatism (eight cases), influenza (three cases) and erythema nodosum (two cases). A diagnosis of trench fever was made in two cases not included in this series.

Treatment.—Sulphapyridine in moderate doses by mouth terminates the disease in a dramatic manner. Fifteen of the patients were so treated, and all manifestations of active disease disappeared within twenty-four hours. There was a rapid return to health, and many patients were discharged to a convalescent depot.

Incidence.—We have unfortunately been able to refer to only a few recent papers about this disease, and these report sporadic cases of chronic meningococcal septicæmia, though Appelbaum (1937) mentions a "recent noticeable rise in incidence in New York City. This is not unusual preceding or following an outbreak of meningococcal meningitis." Our experience with the disease recorded here has led us to believe that this type of meningococcal infection is common whenever meningococcal meningitis becomes prevalent in a community.

SUMMARY

(1) Seventeen cases of chronic meningococcal septicæmia without meningitis are recorded. They were seen (together with about ten other cases whose case-notes are not available) within a period of nine weeks during the prevalence of cerebrospinal fever in the British Expeditionary Force.

(2) Chronic meningococcal septicæmia in sporadic form is not rare, and the suggestion is made that this form of meningococcal infection becomes common whenever meningococcal meningitis is prevalent in a community.

(3) The disease presents a characteristic clinical picture which enables bedside diagnosis to be made with ease.

(4) Sulphapyridine by mouth rapidly cures the disease.

We thank Major H. A. Magnus and other officers for their bacteriological and clinical assistance in furnishing the material for this article; and Major-General J. W. L. Scott, director of medical service, B.E.F., for permission to publish this paper.

REFERENCES

Appelbaum, E. (1937) *Amer. J. med. Sci.* **193**, 96.
Binns, F. and Clancy, J. J. (1939) *Amer. J. Dis. Child.* **57**, 404.
Carbonell, A. and Campbell, E. P. (1938) *Arch. intern. Med.* **61**, 646.
Dimson, S. B. (1938) *Lancet*, **2**, 424.
Heinle, R. W. (1939) *Arch. intern. Med.* **63**, 575.
Soloman, H. (1902) *Berl. klin. Wschr.* **39**, 1045.

TROPICAL MACROCYTIC ANÆMIA IN AN INDIAN TREATED WITH ANAHÆMIN

BY N. HAMILTON FAIRLEY, M.D., D.Sc. Melb., F.R.C.P.

(*From the London School of Hygiene and Tropical Medicine*)

Wills and Evans (1938) report that Indian patients with tropical or nutritional macrocytic anæmia do not respond to the more highly purified liver extracts, such as Anahæmin, which contain the liver principle curative in pernicious anæmia in relatively pure form. They cite this as evidence further differentiating this disease from pernicious anæmia and conclude that there is a new hæmopoietic factor in crude liver extracts and in autolysed yeast extracts responsible for the cure of tropical macrocytic anæmia. The factor, though probably part of the vitamin-B complex, was proved not to be B_1, B_4, lactoflavin, or nicotinic acid. It had not then been separated from the yeast-fuller's earth filtrate of Edgar and Macrae (1937), but recent observations of Foy and Kondi (1939) in Macedonia indicate that in the nutritional macrocytic anæmia of that country this filtrate factor is inert. Napier (1939) stated that, in Indian patients with tropical macrocytic anæmia, anahæmin, in doses which would produce a maximal response in pernicious anæmia, sometimes produced no hæmopoietic response; in other cases even moderate dosage produced a response, and, apparently more often, massive doses produced a response which might be delayed and slightly submaximal. Foy and Kondi (1939), employing even larger doses of anahæmin than those used by Wills and Evans (1938) or Napier (1939), found that Macedonian cases responded as satisfactorily to anahæmin as to the more crude liver preparations, such as Campolon. They suggested that the Macedonian cases differed from those in India, where a high indirect van den Bergh reaction is rare, glossitis is common, and the highly purified liver preparations are inactive. In the following case of tropical macrocytic anæmia in an Indian Moslem the patient was under strict observation longer and was investigated in more detail than is generally possible either in India or in Macedonia.

CASE-RECORDS

A Moslem, aged 33, working in a ship's engine room, had been born in Calcutta and had lived there until he went to sea at 16. Since then he had been employed almost continuously in ships running between India and England or other countries. At 12 he had had malaria, associated with rigors lasting three days. Five years later the fever recurred but soon responded to treatment. A year ago he had transient diarrhœa, but neither mucus nor blood was noted in the stools.

Present illness.—On March 15, 1939, he became giddy and had a syncopal attack. Subsequently he suffered from anorexia, bouts of giddiness, abdominal distension, and looseness of the stools, the bowels acting twice daily. On the 30th he developed fever, with slight shivering, but unassociated with cough or sore-throat. After this he noted giddiness, weakness on walking, and some shortness of breath, cardiac palpitations, and tremors of the extremities. On April 14 he was admitted to the Hospital for Tropical Diseases, London.

Physical examination.—Well nourished, mucosæ pale, but no jaundice. Tongue large, pale, indented laterally by the teeth, and covered with light whitish fur; no ulceration and no atrophy of papillæ. No abdominal distension or atrophy of parietes; abdominal wall contained several subcutaneous nodules, proved by biopsy to be lipomata. Pelvic colon palpable but not tender; spleen and liver not enlarged. Pulse 120, fair volume; B.P. 110/50. Optic disks pale; no hæmorrhages. Lungs normal. No abnormality found on radiography of chest or of stomach and duodenum after barium meal.

Hæmatological investigations.—While under observation for six days the anæmia increased. Red cells (R.B.C.)

fell from 2,000,000 to 1,700,000 per c.mm. and hæmoglobin from 45 to 38 per cent. (see figure). On April 19 R.B.C. 1,700,000; hæmoglobin 38 per cent. (Haldane); colour-index 1·1; mean corpuscular volume (M.C.V.) 105·9 $c\mu$; mean corpuscular average thickness (M.C.A.T.) 2·16 μ. Price-Jones curve: M.D. 7·91 μ, σ 0·7, v 9·56 per cent., megalocytes 18·8 per cent. No evidence of spherocytosis such as occurs in the hæmolytic type of tropical microcytic anæmia. Stained blood smears showed poikilocytosis, fair number of megalocytes and occasional corpuscles presenting polychromasia or basophilic stippling. Normoblasts scanty. Reticulocytes 1·2 per cent.; leucocytes 10,000 per c.mm.; differential count normal; platelets 201,000 per c.mm. Smears of sternal marrow showed many Ehrlich megaloblasts similar to those seen in pernicious anæmia.

Other laboratory examinations.—Van den Bergh negative direct reaction and positive indirect reaction (0·5 unit). Wassermann and Kahn reactions and agglutination tests against the enteric organisms negative. Urine normal; culture negative. Stools contained no ova or protozoa on several examinations; culture gave no dysentery bacilli but numerous small hæmolytic streptococcal colonies. Stool liquid, yellow and very acid, with some

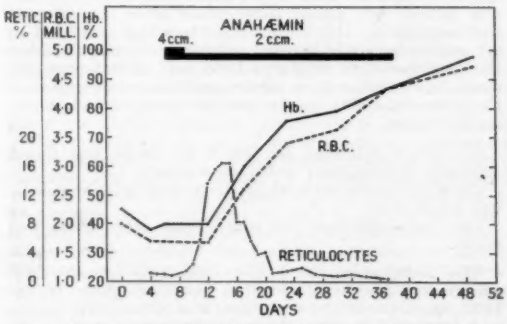


Chart showing response of tropical macrocytic anæmia to injections of anahæmin.

undigested starch residues. Fatty acids 16·2 per cent.; neutral fat 3·9 per cent.; total fat 20·1 per cent.; split fat 80·6 per cent.; unsplit fat 19·4 per cent. Histamine test-meal revealed a maximal acid secretion of 10 c.cm. of decinormal hydrochloric acid half an hour after the injection. Fasting blood-sugar 111 mg. per 100 c.cm.; glucose-tolerance curve fell within normal limits, except that the maximal rise to 174 mg. per 100 c.cm. was not reached until 1½ hours.

Dietary.—The patient's diet during the previous twelve months had been the same as that of the rest of the crew, and there had been no loss of appetite until he fell ill in March, 1939. He took two good meals a day, at 8 A.M. and 5 P.M., and his diet mainly consisted of dal soup, polished rice, ghee, chapatties made from whole-wheat flour, curry, spices, occasional melons, and a limited amount of vegetables (cabbage, pumpkin, and mangels). Fish and meat—about 4 oz.—were eaten two or three times a week, but the diet contained no eggs and practically no milk. Beverages included tea and coffee but no alcohol.

Treatment.—Uncomplicated tropical macrocytic anæmia was diagnosed. Owing to the difference of opinion about the efficacy of the more purified forms of liver extract in in this disease, the patient was given large doses of anahæmin (British Drug Houses) by intramuscular injection, 4 c.cm. being administered daily for the first three days and 2 c.cm. each day subsequently for the next twenty-nine days. Ordinary hospital light diet was given without reinforcement with vitamins.

Progress.—During the first fortnight the patient had a mild fever, the maximal temperature of 101·5° F. being recorded on the seventh day. Subsequently there was an occasional evening rise to 99° F., but never higher. The pulse- and respiration-rate were similarly raised, and diarrhœa during the febrile period was somewhat troublesome. The only abnormality found was the predominance of hæmolytic streptococci in the fluid stools.

The administration of anahæmin was rapidly followed by clinical improvement. A reticulocytosis with a maximal rise of 16·4 per cent. on the eighth day followed the injection, and this was succeeded by a rapid fall to normal limits within a week (see figure). Rapid regeneration of blood ensued, and within thirty-one days the red cells increased by 2,640,000 and the hæmoglobin by 47 per cent. This represented a daily average increase of 85,000 red cells per c.mm. and 1·5 per cent. hæmoglobin. The secretion of hydrochloric acid also improved, and on May 11, twenty days after the start of treatment, a test-meal showed 52 c.cm. N/10 HCl an hour after the meal; some forty-five minutes after the administration of histamine 105 c.cm. was recorded. The diarrhœa gradually ceased, giddiness and palpitation disappeared, and the reserve of energy increased. The patient became mentally alert, the mucosæ lost their pallor, and normal health was restored. Forty-three days after the start of treatment a blood-count showed R.B.C. 4,710,000; hæmoglobin 98 per cent., C.I. 1. The Price-Jones curve was almost normal: M.D. 7·61, σ 0·61, v 7·98, megalocytosis 2·6 per cent., M.C.V. 92·5 $c\mu$, and M.C.A.T. 2·035 μ.

COMMENTS

The clinical features, the megalocytic anæmia, the numerous Ehrlich megaloblasts in sternal marrow smears, the presence of hydrochloric acid in the gastric juice, and the absence of reticulocytosis, spherocytosis, and hyperbilirubinæmia showed the case to be one of typical uncomplicated tropical macrocytic anæmia. At no time did the picture remotely resemble tropical sprue.

The response to large doses of anahæmin was unexpectedly satisfactory. It was associated with reticulocytosis, rapid regeneration of blood, and a restoration of the secretion of hydrochloric acid from one of hypoacidity to a level bordering on hyperacidity. Similarly the Price-Jones curve indicated a remarkable degree of improvement. The dosage of anahæmin employed was larger than that used by Wills and Evans (1938) in their Indian series, and the submaximal reticulocytosis noted in certain of their cases suggests that their results would have been more satisfactory with a larger dose. Foy and Kondi (1939) have suggested, largely because of the reported lack of response to anahæmin, that the tropical macrocytic anæmia of India may differ from the nutritional macrocytic anæmia observed in Macedonia. In my opinion the difference lies in a more widespread incidence, among the refugee population of Macedonia, of chronic malarial splenomegaly associated with generalised hypertrophy of the reticulo-endothelial system and the hæmolytic type of anæmia which it induces. The peasants there live on a border-line dietary poor or deficient in good animal protein and probably other blood-building constituents. It is not surprising that, with an overworked and undernourished bone-marrow, the demands of pregnancy are likely to precipitate widespread nutritional megalocytic anæmia.

Fairley, Bromfield, Foy, and Kondi (1938) have emphasised the necessity for massive doses of liver extract administered parenterally or of Marmite in the treatment of nutritional macrocytic anæmia, especially where a hæmolytic factor coexists. Anahæmin has to be given in still larger dosage and possesses no advantage over the more crude liver extracts given parenterally; on the grounds of expense alone its administration becomes prohibitive in the routine treatment of tropical or nutritional macrocytic anæmia.

REFERENCES

Edgar, C. E. and Macrae, T. F. (1937) *Biochem. J.* **31**, 886.
Fairley, N. H., Bromfield, R. J., Foy, H. and Kondi, A. (1938) *Trans. R. Soc. trop. Med. Hyg.* **32**, 132.
Foy, H. and Kondi, A. (1939) *Lancet*, **2**, 360.
Napier, L. E. (1939) *Indian med. Gaz.* **74**, 1.
Wills, L. and Evans, B. D. F. (1938) *Lancet*, **2**, 416.

SEROUS PLEURAL EFFUSIONS

BY J. M. VAIZEY, M.A., M.D. Camb., M.R.C.P.
AND
KENNETH M. A. PERRY, M.A., M.D. Camb., M.R.C.P.
MEDICAL OFFICERS, EMERGENCY MEDICAL SERVICE

THERE is a considerable divergence of opinion about the prognosis and appropriate treatment of serous pleural effusions (Maurer 1937). The possibility that such effusions might be due to chill, trauma or rheumatism used to be emphasised (Anderson 1928, Christian 1938), but now all are regarded as tuberculous unless some obvious cause, such as secondary carcinomatosis, is found.

EVIDENCE OF TUBERCULOSIS

At necropsy cases of pleural effusion have shown changes macroscopically and microscopically characteristic of tuberculosis. This is conclusive evidence so far as it goes; but most patients with pleural effusion recover, and it is arguable that in many of those who recover the effusion is due to some other cause. The finding of tubercle bacilli in the pleural fluid either on direct examination or by culture of the centrifuged deposit or by inoculation of guinea-pigs has shown that some of the patients who survive are tuberculous, but probably half of the tests give a negative result. Evidence of tuberculosis in the underlying lung or elsewhere in the body always strongly suggests that the effusion is tuberculous, but again it is by no means constant; and the very presence of an effusion makes small tuberculous lesions in the lung difficult if not impossible to detect even radiologically. Further investigation along this line is necessary either after replacement by air or after absorption of the fluid. The tuberculin reaction has been used in evidence, but it is so often positive in healthy adults in this country that it cannot be regarded as of much value for this purpose. The subsequent course of the disease is the most important evidence. It is generally accepted that patients with pleural effusions of uncertain ætiology subsequently develop tuberculosis of the lungs more frequently than would be expected from the incidence of tuberculosis in the general population; but how frequently and in what form is still unsettled.

Serous pleural effusion arises in both sexes at all ages. Chronic pulmonary tuberculosis is rare below the age of 15 and is common above that age; it has a notoriously bad prognosis in girls aged 15–25. Above the age of 40 carcinoma of the bronchus and secondary carcinoma are increasingly common, whereas tuberculosis becomes more chronic and fibrotic and less likely to lead to effusion. These factors should therefore be taken into account in any analysis of pleural effusion. Attention should be paid also to any radiological evidence of disease in the lung underlying the effusion. This may be seen after replacement by air or after the fluid has been absorbed.

PROGNOSIS

In this country, children show apparently more favourable results than adults. Graham (1925) traced 39 of 56 children, and found 7 cases of tuberculosis and 2 deaths. Smithers (1934) followed up 32 cases out of a series of 49 and also found 7 cases of tuberculosis, 2 of which had proved fatal. An interesting point is that the von Pirquet test was negative in 8 of Graham's cases, and that the incidence of tuberculosis among near relations was no higher than 2 in Smithers's series. Both of these points are at least a little surprising if every serous effusion is assumed to be tuberculous.

Many investigations to elucidate the prognosis have been made in adults. One of the earliest, by Hammon in 1897, showed that of 562 cases of pleural effusion 167 (30 per cent.) developed tuberculosis. It is remarkable that such a high figure should have been found as early as 1897, when radiology of the chest was not practised. In more recent times two large series have been reported from Scandinavia. Borelius (1932) followed up 230 patients, ten to twenty years after their pleural effusion, and found that 23 had died of pulmonary tuberculosis. Kallner (1937) gives a detailed analysis of 690 cases which he followed up for periods up to twenty years. He gives a mortality of 22 per cent. and a morbidity of 39 per cent. from tuberculosis in those followed for the longest time—i.e., till twenty years or earlier death. Trudeau (1939) reports a series subdivided into those complicating recognised pulmonary tuberculosis and those apparently primary. In the tuberculous group, out of 73 patients 49 were well and working five or more years later and 10 had died. These figures compare favourably with cases of pulmonary tuberculosis without effusion, and this may be due to their earlier recognition or to the natural collapse of the lung produced. In the other group, where effusion was apparently primary, out of 83 cases 74 were well and working 4 others were alive, and 5 had died. Trudeau's figures, however, are based on a questionnaire issued to the patients and not on clinical or radiological examination. Further, the questionnaire was issued only about three years after the effusion had occurred. Our series was therefore collected of all patients with pleural effusion in the London Hospital between 1926 and 1936, and an attempt was made to examine them again and take radiograms of their chests. The results can be grouped into three main classes.

(1) Pleural effusions for which no cause was found clinically, radiologically or bacteriologically.
(2) Pleural effusions in which the presence of tuberculosis was established.
(3) Pleural effusions for which some other cause was found.

We have subdivided the first two groups into age-groups and differentiated between those before 1933, when the follow-up period was at least five years, and after 1933, when it was at least two years. In the third group we considered such subdivision of no value and only separated those cases where the diagnosis was confirmed by necropsy. An apparent duplication will be noted here, some cases due to carcinoma appearing in table I and some in table III; but all patients who were at the time of their admission regarded as having primary effusions have been placed in table I, regardless of their ultimate course.

TABLE I—TUBERCULOUS CASES

—	Aged under 15	M. 15–25	F. 15–25	26–40	Over 40	Total
Total	6	15	14	16	19	70
Not traced ..	3	7	10	13	7	40
Traced ..	3	8	4	3	12	30
Died	1	2	0	2	3	8
Recurrent effusion	1	0	0	0	1	2
Well, radiogram clear ..	1	2	0	0	0	3
Well, no radiogram	0	4	1	0	4	9
Extensive pulmonary tuberculosis	0	0	2	1	4	7
Tuberculosis elsewhere ..	0	0	1	0	0	1

M, males; F, females.

The tables show that there were some 300 apparently primary cases, 70 tuberculous cases and 70 symptomatic cases, besides 21 with necropsy records. The follow-up was disappointing, and in some groups less than half of the patients were traced. The outbreak of war prevented this work from being completed as thoroughly as we could have wished. The attempt to visit the homes of those who did not reply had to be abandoned for this reason. We feel that probably a larger proportion of the untraced group were tuberculous than of the traced group, but we have felt justified in drawing tentative conclusions

TABLE II—PRIMARY EFFUSIONS

—	Under 15		M., 15–25		F., 15–25		26–40		Over 40		Total		
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	
Total	45	18	61	19	43	14	46	13	32	17	227	81	308
Not traced	26	4	32	7	28	6	31	8	11	7	128	32	160
Traced	19	14	29	12	15	8	15	5	21	10	99	49	148
Well, no radiogram	7	0	7	1	6	2	2	2	3	1	25	6	31
Well, radiogram clear	11	12	15	9	4	4	5	3	6	4	41	32	73
Evidence of pulmonary tuberculosis	0	0	2	1	3	1	5	0	0	0	10	2	12
Recurrent effusion	0	1	0	0	1	1	0	0	0	1	1	3	4
Died of pulmonary tuberculosis	1	0	2	0	1	0	1	0	2	1	7	1	8
Died of new growth	0	0	1	0	0	0	0	0	6 (+ 1)*	1	7 (+ 1)	1	8 (+ 1)
Died—other condition or cause uncertain	0	1	2	1	0	0	0	0	3	2	5	4	9
Tuberculosis elsewhere	0	0	0	0	0	0	2	0	0	0	2	0	2

(1) Followed up more than 5 years. (2) Followed up 3-5 years.
* One case definitely carcinoma of lung treated surgically now alive.

from the material available. An appreciable number of patients died of conditions other than tuberculosis, a striking example being a patient who in 1926 had a pleural effusion and in 1932 developed a carcinoma of the breast, from which she died in 1934. At necropsy no evidence of tuberculosis of the lungs was found.

In the youngest age-group (0–14) just over half the patients were traced, and only 1 out of 33 in the primary group had subsequently developed tuberculosis; hence children with pleural effusions often do well and do not develop tuberculosis. Only 6 children with manifest tuberculosis and pleural effusion were found, and of these 3 are certainly alive and only 1 is dead. Many more cases were found between the ages of 15 and 25. Of the primary ones 80 were men and 57 women; 2 of the men and 1 the women died of tuberculosis; 3 of the men and 4 of the women had extensive pulmonary tuberculosis when radiographed subsequently. In 24 men and 8 women, however, the subsequent radiogram showed no evidence of disease. Though these figures are less favourable than those obtained among children, they do show a high recovery-rate. The third age-group, 25–40, shows similar figures to the second, though the numbers are much smaller. The fourth group, 41 and over, shows the complicating effect of carcinoma, from which about a quarter of the patients died. Deaths from other conditions, such as hyperpiesia, cerebral hæmorrhage and diabetes mellitus, were also recorded. Altogether half the patients traced had died, and only 3 of them from tuberculosis. The outlook is grave for the patients with proved tuberculosis when there are tubercle bacilli in the sputum and even more so when infiltration is seen in the radiogram. Of 30 patients 6 died within a year and 2 others in three and six years. Occasionally, however, the condition may improve and the radiogram clear considerably, as happened in 3 of our cases.

DIAGNOSIS

The character of the fluid may be a key to further diagnosis. The material at our disposal had not been very fully studied from this point of view. A recent paper by Gloyne (1939) indicates various methods by which the tubercle bacillus may be demonstrated more often in fluid, and emphasises the possibility of tubercle bacilli and cells being lost when the fluid is allowed to clot before examination. With such modifications as he suggests there can be little doubt that tubercle bacilli will be found more often. In the present series we can only comment on two features: the results of inoculation of guineapigs and the presence of blood in the effusion. Inoculation of guineapigs has proved distinctly disappointing: of 39 pleural fluids so tested * only 11 were positive for tuberculosis, and among the negative were 2 with radiological evidence of tuberculosis and even 1 with tubercle bacilli in the sputum. It is not surprising, therefore, to find that in following these cases up there was no significant difference in the prognosis of the two groups: 4 of our patients were subsequently radiographically clear and clinically well in spite of having previously had tubercle bacilli so demonstrated in the fluid. The presence of a bloodstained pleural effusion does appear to be of some diagnostic importance, for of 39 cases in the present series carcinoma was certainly the cause in 8 and was very probably the cause in 8 others; 2 were certainly and 1 probably due to endothelioma; 1 was certainly tuberculous and 1 probably was tuberculous, for he had previously had tuberculous peritonitis. Hyperpiesia, mitral stenosis and Hodgkin's disease each accounted for 1 case, and in 15 no obvious cause was found; 8 of these are known still to be alive and well and have had no further trouble.

* The method for demonstrating tubercle bacilli used was to inoculate a guineapig with the centrifuged deposit of 10 c.cm. of fluid from which the clot had been broken.

TABLE III—SYMPTOMATIC PLEURAL EFFUSIONS

—	Necropsies	Died in hospital; no necropsy	Discharged alive	Total
Carcinoma	10	8	26	44
Endothelioma	2	0	0	2
Hodgkin's disease	1	0	4	5
Lymphosarcoma	1	0	2	3
Heart-failure (rheumatic carditis)	2	1	11	14
Heart-failure (other causes)	2	1	9	12
Nephritis	0	0	4	4
Tuberculosis	3	4*	0	7
Total	21	14	56	91

* Alleged to be tuberculosis but not proved.

The series is small, but it is remarkable that only 1 or at most 2 cases of bloodstained effusion due to tuberculosis should have been met in eleven years at the London Hospital among some 450 pleural effusions. Thus, contrary to orthodox teaching (Price 1937), bloodstained effusions seem seldom to be tuberculous. Carcinoma, with which may be included other new growths, is the commonest cause and is responsible for half the cases. Carcinomatous effusions are, however, not always bloodstained, and in the present series there were 2 cases with clear fluid confirmed by necropsy.

If tuberculosis does develop after a pleural effusion, it is usually found on the same side of the chest. In the present series only 2 cases were recorded in which the tuberculous process was confined to the opposite lung, and in 6 it was bilateral, with the more extensive process in the opposite lung in 2. In 2 cases tuberculosis had developed elsewhere in the body—i.e., wrist and knee—but by far the commonest site was the lung on the affected side, and this was affected alone in 20.

TREATMENT

Opinion is also divided about the most appropriate treatment. There are advocates of aspiration, air replacement, sanatorium treatment and masterly inactivity. Since cases, especially in those under 15

years of age, usually run a favourable course, unless pulmonary tuberculosis is also discovered, conservative methods are justified; but such patients must be repeatedly examined clinically and radiologically. If, however, pulmonary tuberculosis is found, treatment in a sanatorium by pneumothorax is probably indicated. Aspiration alone is sometimes needed to relieve symptoms due to the large volume of the fluid, but is mostly used for diagnosis. The risk of aspiration must be small, because no death attributable to it took place in this series.

SUMMARY

A study was made of all cases of serous pleural effusions at the London Hospital 1926–36. Of these, 308 were apparently primary, 70 showed definite evidence of tuberculosis, and 91 were symptomatic of some other disease. An attempt was made to discover the subsequent course of these cases, and the results are given, tabulated according to age. The most striking features were the infrequency of pulmonary tuberculosis following pleural effusions below the age of 15, the infrequency of pulmonary tuberculosis following bloodstained effusions, and the frequency of carcinoma among patients with bloodstained effusion. In the intermediate age-groups, 15–25 and 26–40, the incidence of tuberculosis was much higher; and, in spite of many cases not traced, the incidence of subsequent tuberculosis can hardly have been less than 30 per cent. When tuberculosis is manifest at the time of the effusion, the prognosis is worse, though possibly not worse than that of pulmonary tuberculosis without effusion.

We thank the physicians of the London Hospital for permission to investigate the patients who had been under their care; Dr. Horace Evans for much helpful advice and criticism; and the Yarrow Research Fund for a grant to defray the expense of this investigation.

REFERENCES

Anderson, H. B. (1928) *Amer. Rev. Tuberc.* **17**, 147.
Borelius, R. (1932) *Acta med. scand.* **79**, 391.
Christian, H. A. (1938) Osler's Principles and Practice of Medicine, 13th ed., New York, p. 816.
Gloyne, S. R. (1939) *Post-grad. med. J.* **15**, 399.
Graham, S. (1925) *Glasg. med. J.* **104**, 1.
Kallner, S. K. (1937) *Acta med. scand.* **92**, 549.
Maurer, G. (1937) *Proc. R. Soc. Med.* **30**, 843.
Price, F. W. (1937) A Textbook of the Practice of Medicine, 5th ed., London, p. 1260.
Smithers, D. W. (1934) *Arch. Dis. Childh.* **9**, 245.
Trudeau, F. B. (1939) *Amer. Rev. Tuberc.* **39**, 57.

IMPROVED OUTLOOK IN X-RAY CARCINOMA

BY W. SAMPSON HANDLEY, M.S. Lond., F.R.C.S.
CONSULTING SURGEON TO THE MIDDLESEX HOSPITAL, LONDON

IN 1934 (THE LANCET **1**, 120) I expressed the hope that for the future X-ray carcinoma would be prevented. But the latent period of the disease is sometimes so long that sporadic cases are still bound to arise, and carelessness will still claim its penalties if known methods of protection are neglected. Briefly stated, my view is that, if a suspicious warty area locally excised is found to be a carcinoma, the patient's safety demands a complete dissection of glands, at least as soon as glandular enlargement can be detected in the axilla or in the supratrochlear gland of the affected side. The precaution is wise even in cases where the glands feel normal on palpation, though it cannot then be so strongly urged. The object of the operation is to cut the main line of dissemination in an early stage.

Of the two cases of X-ray carcinoma recorded in my previous paper, the British radiologist on whom I operated in June, 1931, excising the supratrochlear and all the axillary glands, died of coronary embolism in 1934, without recurrence of the growth. The second case was in a continental radiologist with multiple recurrent X-ray carcinomata of the right hand. In 1931 I removed a portion of the hand, the axillary and bicipital glands, and a band of deep fascia intervening between these glands and carrying the lymphatic vessels. This patient has wisely abandoned radiology but is now in active medical practice and free from recurrence.

I have since seen five further cases.

A manufacturer of X-ray apparatus consulted me in June, 1934, for a large advanced carcinoma of the left fourth finger, with hard and enlarged left bicipital and axillary glands. The case was an unpromising one, for after removal of the axillary contents nodules of growth were found in the axillary fat round the lymphatic glands. The axillary glands were infected right to the apex of the axilla. In January, 1935, a fresh carcinoma was removed from the palm of the left hand, and in May, 1935, he was free from signs of recurrence and had gained 20 lb. in weight; but in September, 1935, the appearance of deeply situated nodules, two in the forearm and one in the upper arm, led to an amputation through the shoulder-joint. In December, 1935, a new carcinoma appeared in the left submammary fold, and, though it was removed, recurrence took place in the axilla with widespread permeation of the axillary fat, leading to the patient's death in 1937. Operation in this case was a forlorn hope. The patient was seen too late but was enabled to live a fairly normal life until near his end and was probably saved much pain.

A radiographer with multiple X-ray carcinomata of both hands consulted me in 1934. No enlarged glands were palpable. The axillary and bicipital glands were completely cleared on both sides, and the necessary local operations were performed on the hands. One gland in the right axilla showed a secondary deposit. Further local operations on the hands have been necessary to deal with fresh carcinomata, and the patient now has one finger remaining on the left hand and two on the right hand. The thumbs are intact. Another finger may have to be removed, but there is no sign of axillary or visceral recurrence. At the present time he is active, free from pain, and in good general health.

A professor of surgery with X-ray carcinoma of the hand had his axillary glands removed. He died four years later from an independent visceral growth. There was no recurrence of the X-ray carcinoma.

A lady who has handled radium for many years consulted me for an early radium carcinoma. I removed the affected finger and a bicipital gland and she is now well.

A medical man had had repeated local operations on the hand for X-ray carcinoma. I removed a recurrent nodule in his palm and cleared his axilla. One of the axillary glands was infected. He has since had no recurrence.

In the *Times* in December, 1939, there appeared an obituary notice of the eminent French radiologist, Prof. Charles Vaillant, who had died at the age of 77. He was in charge of the X-ray departments of the Baudeloque Clinic and Lariboisière Hospital in the 'nineties.

"Gradually the characteristic dermatitis set in," says the *Times*, "and in 1906 he had to lose a finger. Four years later another finger was amputated, but he refused to give up his work in spite of much suffering, with the result that a hand had to be amputated in 1915. Even then he went on working, and in 1920 it was necessary to disarticulate the left shoulder. A year later his condition became so grave that he was forced to retire, being incapable of further activity."

Professor Vaillant's tragic history epitomises the usual fate of sufferers from X-ray carcinomata of the hands who are treated by purely local operations on the primary growths. In his case the course of the disease was unusually prolonged—a doubtful advantage. On the other hand, of six patients whom I have personally treated by early removal of glands one died of an independent disease without recurrence; one, a late case when first seen, died of recurrence; and four have remained well for various periods up to nearly nine years.

CONSERVATION OF A USEFUL THUMB AFTER COMPLETE PHALANGEAL NECROSIS

By Arnold K. Henry, M.B. Dubl., M.Ch. (Hon.) Cairo, F.R.C.S.I.

EMERITUS PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF EGYPT; READER IN SURGERY IN THE UNIVERSITY OF LONDON, AT THE BRITISH POSTGRADUATE MEDICAL SCHOOL

Septic necrosis of distal phalanges seldom calls for amputation, which leads to nailless stumps that lack the character of fingers. Mere removal, on the other hand, of dead bone, allowed to loosen spontaneously, will leave recognisable digits; often nails remain, and sometimes bones regenerate, but even if they do not the fingers keep a natural shape. Appreciation, however, of this fact is still too rare, and the record of a case with widespread necrosis of the thumb may further emphasise the value of treatment confined to acts of timely scavenging.

Infection of three weeks' duration, caused by a splinter in a man aged 71, gave the following signs: a swollen, purplish-red, and not very painful left thumb, exuding pus from four small openings and moving only at the metacarpophalangeal joint; localised inflammation; a blood-count of 7000 leucocytes, with 58 per cent. of polymorphs. A radiogram showed necrosis of both phalanges, which were removed under gas-oxygen anæsthesia, leaving behind a resistant flake from the base of the proximal bone. The wound was cleansed with ether and packed for four days with ribbon gauze impregnated with dilute bipp. After withdrawal of the pack discharge stopped but reappeared in three days. Meanwhile my then house surgeon, Mr. G. S. Barbour, drilled a hole in the thumb-nail and, with silk thread and wire splinting, applied extension in the hope that bone might grow again. Five weeks later the basal flake left at the first operation had become loose and was removed; no trace then remained of either phalanx, and suppuration ceased. Bone did not regenerate, but the soft parts which once had clothed the two phalanges gradually shrank down on the metacarpal head to form a firm and satisfactory "pulp" backed by a normal nail. The patient's happy disposition helped to preserve the movements of the metacarpophalangeal joint, and this allowed him to bring the dwarfed thumb into strong contact with all the left fingers except the little one.

(*a*) (*b*)

Phalanges of left thumb lost by necrosis: (*a*) patient's spontaneous method of presenting thumbs for comparison; (*b*) correct alignment of thumbs.

A photograph (see figure, *a*) taken two years later shows how the patient offers both hands for inspection. The counterfeit presentment of the left looks then sufficiently natural to leave him vaguely informed of its true state, and we thought it best to let his mind dwell on this picture without obtruding the other (*b*); for, though men add no cubits to their stature by taking thought, they assume quite easily the presence of a lost phalanx.

My special thanks are due to Mr. V. Willmott for his photographs.

PANEL AND CONTRACT PRACTICE

It has again become necessary to suspend the regional medical service.

Interned Practitioners

Internment of enemy aliens has led to a number of medical men being taken from their practices, and some insurance committees have had difficulty in arranging for treatment of the patients and for remuneration of the interned doctor. In a circular addressed by the Ministry of Health to insurance committees it is pointed out that the treatment a practitioner is required to render to his insured patients under his contract is personal, subject to his right to act by deputy when prevented from giving personal attention by other professional duties, temporary absence from home or other reasonable cause; subject also to his right to act through any partner so long as reasonable steps are taken to secure continuity. It does not appear that an interned practitioner could satisfy the requirements of his terms of service if his internment is to be protracted. The Minister suggests that where an interned practitioner is able to make satisfactory arrangements for the conduct of his practice, the committee might properly recognise such arrangements as a temporary expedient, reviewing the position after a period of (say) three months. If, however, there is no apparent likelihood of early release the committee should consider whether the contract is not at an end in consequence of the doctor's inability to fulfil it. If they take that view they should notify the practitioner of their intention to remove his name from their medical list.

There is nothing to disentitle an interned practitioner to remuneration in respect of his insured patients for the period while he is still in contract with the committee. The question whether an interned practitioner should be accorded the benefit (total or partial) of any protection of practices scheme which may be in operation in the area is primarily one for the authorities concerned. The London local emergency committee has decided that the benefits of their scheme do not apply to internees.

Essex Public Medical Service

The sixteenth annual report of this pioneer service shows that despite some war-time dislocation it has done better financially than ever before. Subscriptions increased by over £900 as compared with 1938 and the surplus of income over expenditure (£710) is up by £60. In the areas affected by the evacuation scheme there were between 7000 and 8000 subscribers. At the end of March collectors enumerated the evacuees on their books, the total being 1460. These are being kept on their doctors' lists but are not paying; the average weekly loss in respect of them is estimated as at least £20. Some forty members have been called up; at the end of the year the number of doctors on the books was 416, of whom 306 were active and the remainder honorary.

"... A frog or a university professor are examples of what is called living matter."—Prof. Lancelot Hogben, F.R.S., Principles of Animal Biology, London.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF THERAPEUTICS AND PHARMACOLOGY

AT a meeting of this section held on June 11, with Dr. J. W. TREVAN in the chair, a discussion on clinical experiences with

Sulphathiazole in Staphylococcal Infections

was opened by Mr. A. J. EWINS, D.Sc. Dealing with the chemistry of this new drug, he said that a number of publications concerning it had recently appeared in the United States, and claims have been made that it is a particularly effective chemotherapeutic agent against staphylococcal infections, as effective as sulphapyridine against pneumococcal infections, better tolerated and less toxic. It was first prepared in this country in early 1938, and is one of the derivatives of the original sulphonamido-chrysoidine. He traced the steps of its evolution.

Mr. E. C. BUTLER said that staphylococcal septicæmia is much more common and fatal than is generally realised. Every death from osteomyelitis, nearly every death from cavernous sinus thrombosis, and many deaths from boils, carbuncles and infected fingers can be attributed to *Staphylococcus aureus*. Death may take place in two or three days from an overwhelming staphylococcal bacteræmia. Any treatment, to be effective, must therefore be started at the beginning of the disease, and must either be able to cure a patient who has a positive blood-culture, or else accelerate recovery in such lesions as may cause bacteræmia—e.g., carbuncles of the face. The problem of treatment is first to raise the resistance of the serum to the toxins produced by the staphylococcus. The important toxin is the leucocidin, and most patients have a low antileucocidin content in the blood for the first two days. The staff of the London Hospital therefore now give to every patient with a severe staphylococcal infection 25 c.cm., or about 20,000 units, of staphylococcal antitoxin with a high antileucocidin content. Secondly, it is necessary to find a drug which may help to destroy staphylococci once the patient's resistance has been raised. The prontosil derivatives do not affect the course of the severe cases. Thirdly, it is necessary to eliminate the source of the blood infection by adequate drainage, excision or amputation. The resistance of the patient may then be strong enough to deal with the remaining systemic infection.

Mr. Butler described the treatment with sulphathiazole of five cases of severe staphylococcal infection. A woman of 62 with a painful infected finger had a continuous pyrexia which did not yield to sulphanilamide. Blood-culture was positive to *S. aureus* and the white-cell count was 12,000. When first seen she was running an irregular temperature and apparently had no active infection of the finger. She received four tablets of sulphathiazole, and then two tablets four-hourly for four days. The finger was amputated after a week and the course was repeated. The blood-culture became negative and the temperature normal, but she died of heart failure and toxæmia, with no active focus of infection or signs of septicæmia. In a man of 55 with a poisoned cheek no definite improvement followed the administration of sulphathiazole, possibly because the infection was of a mixed type. He died of a pyopneumothorax from two small pyæmic abscesses in the right lung. Another old woman with a very bad staphylococcal infection of the skin did not respond to treatment. A woman of 32, however, who suffered from a severe cellulitis of the leg after bursting a varicose vein, and whose blood culture showed pure *S. aureus*, rapidly improved and recovered after receiving 20,000 units of antitoxin and a full course of sulphathiazole up to 30 g. A boy aged 12 with staphylococcal bacteræmia was given 20,000 units of antitoxin and a course of 30 g. of sulphathiazole, but did not improve. He developed hemiplegia and pneumothorax, but his blood meanwhile became sterile. It is doubtful whether the sulphathiazole destroyed the blood infection, for at the end of the course the culture still contained 140 colonies, and the drug is too rapidly excreted—as far as present knowledge goes—to have any delayed action.

Staphylococcal infections, Dr. Butler went on, are far more difficult to treat than hæmolytic streptococcal infections. In his limited experience sulphathiazole has little or no beneficial effect on a staphylococcal infection where the blood-culture is positive. It may, however, be of benefit after the source of the bacteria has been removed, or when the lesion is localised, such as in a carbuncle or cellulitis. Since all deaths from staphylococcal infections are due to bacteræmia, sulphathiazole should not appreciably lower the high mortality. Early bacteriological diagnosis is essential and should be supplemented by quantitative blood-cultures. The minimum dose of sulphathiazole is 2 g. at the start and then 2 g. four-hourly up to an average of 30 g. In severe cases 2 g. every two hours could be given safely if a differential white-cell count were made at the end of the second day. The drug should not supplant conservative surgery or the giving of adequate antitoxin. The high mortality of staphylococcal bacteræmia will only be diminished, he thought, by continuous research and close co-operation between the surgeon and the bacteriologist.

Dr. H. M. MCCREA gave details of two cases treated with sulphathiazole.

A middle-aged man suffered from a large carbuncle on the back of the neck, culture from which gave a pure growth of *S. aureus*. After a week's ordinary treatment he was discharged with a small area of healthy granulations at the site of the carbuncle. Next day he complained of very severe pain in the left ilium, and two days afterwards the temperature suddenly rose from normal to 105° F. The blood was sterile, but the leucocyte count rose to 16,000, with 91 per cent. polymorphs. The temperature dropped and rose again to 104° F., the rise being accompanied by a severe rigor. The blood was still sterile but *S. aureus* was found in the urine and sputum. The pain in the ilium increased and extended to the knee, and both elbow-joints became very painful on movement. An abscess in the ascending ramus of the pubic bone was drained, and a piece of the bone gave a pure culture of *S. aureus*, which could also be cultured from the fluid of the elbow-joints and from the pus expectorated from the base of the right lung. Sulphathiazole was given, 6 g. in the first twelve hours and then 1 g. four-hourly. The condition quickly improved, and the improvement held until the sixth day, when a circumscribed swelling appeared in the left triceps. The sulphathiazole was stopped because of extreme nausea after 25 g. had been taken. After another four days a second course of the drug was given. In twenty-four hours multiple painful raised red papules about the size of a shilling appeared on the front of the right tibia, and a small swelling was palpable at the insertion of the deltoid. At the end of the course the temperature was normal and the symptoms were improving. Convalescence now set in, and recovery was practically complete. The evidence for the action of the sulphathiazole was, in Dr. McCrea's opinion, that the purulent fluid did not again collect in the elbow-joints, the triceps swelling did not break down, the swelling in the deltoid quickly disappeared, the painful papules on the tibia disappeared, and the urine became sterile after the second course.

The second case was in a spinster of 33 with a carbuncle on the back of her neck. Culture gave a pure growth of *S. aureus* and the blood-count showed nearly 25,000 white cells. Under conservative treatment the temperature suddenly rose to 105° F. and blood culture gave *S. aureus*. Sulphathiazole was given, but irregularly and in 1 g. doses because of vomiting. On the sixth day, when the tablets

were stopped after 28 g. had been given, the temperature rose again to 103° F. and acute pain was felt in the epigastrium. The blood-culture was negative, but the leucocytes, after a steady fall, rose to 20,000. The blood clot in a large plug of sputum gave a pure growth of *S. aureus*. The patient then made slow and steady progress and recovered. A later injury to the knee caused effusion, but the fluid was sterile. The other points in favour of the curative effect were the fact that the septic infarction was not followed by abscess or empyema, and no other complications occurred.

Dr. McCREA concluded that the product had an extremely beneficial influence on the course of a particularly fatal disease.

Dr. GEORGE MELTON described six cases of osteomyelitis and five cases of carbuncle of the face treated with sulphathiazole. The first of the osteomyelitis cases showed a marked improvement. In the second case the pyrexia resisted the drug but subsided after a subperiosteal abscess had been drained. In the third case the condition cleared up after the drug was given. In the fourth case, a Brodie's abscess, pyrexia followed drainage but receded after sulphathiazole was given. In the fifth case the drug failed to reduce the pyrexia. The sixth case was still under treatment. All the five patients with carbuncles recovered. Symptoms of intoxication with the drug were vomiting and nausea, and a tendency to leucopenia was observed after large doses. Two patients developed a rash like that of erythema nodosum.

Dr. H. S. BANKS gave the results of the treatment with sulphathiazole of meningococcal infections in thirteen adults and two children. None of the cases was severe. He usually started with a few doses of sulphapyridine, and after it produced vomiting he changed to sulphathiazole. He would not say more than that he had been impressed with the rapidity with which clinical improvement followed the giving of the drug and the cerebrospinal fluid was cleared of organisms and cells. He found that the drug caused no nausea or depression, and vomiting was never comparable to that caused by sulphapyridine; there was practically no cyanosis. The cerebrospinal fluid levels were considerably less than would be found after corresponding doses of sulphapyridine.

Dr. K. M. A. PERRY contributed an account of three cases. The first, an osteomyelitis of the spine with abscess, did not improve after 25 g. of sulphathiazole, aspiration of the abscess, and splinting in plaster. In the second case, an osteomyelitis of the head of the radius, the blood-culture was sterile but a course of 25 g. did not clear up the condition; nevertheless, pus withdrawn from the arm was sterile. The third patient, a boy who had a boil on his right elbow, was admitted with a temperature of 104° F. and some neck rigidity. During a course of sulphapyridine his temperature dropped two degrees, but afterwards it rose again. The blood showed thirty colonies of *S. aureus*. He then received a course of 60 g. of sulphathiazole—two doses of 4 g. each at the beginning and then 3 g. every four hours—but his temperature remained at 104° F.

Dr. E. N. ALLOTT observed that many specimens of urine of patients who have received sulphathiazole contain crystalline derivatives of the drug, sometimes in large quantities. In a febrile patient who is not excreting much urine these products threaten to interfere with the efficient working of the kidney. Sulphathiazole tends to form a more insoluble compound than sulphapyridine. Fluids should therefore be pushed energetically during the whole course.

The CHAIRMAN suggested that sulphathiazole does not give the same dramatic control over the staphylococcus as sulphapyridine and sulphanilamide give over streptococcal infections. Differences in its observed action may be due to differences in the strains of the organism. Staphyloccocal infections tend, he said, to produce abscesses containing loculi into which the drug cannot penetrate; these may account for some of the failures.

REVIEWS OF BOOKS

Religion in Science and Civilisation

By Sir RICHARD GREGORY, F.R.S. London: Macmillan and Co. 1940. Pp. 366. 12*s.* 6*d.*

"Because science signifies new knowledge it must at all times be a disturbing influence upon society and require adjustments of thought and action to it. On this account there has always been a clash between it and traditional beliefs, whether relating to religion or to other humanistic standards of value."

These aspects of science have always interested Sir Richard Gregory and after he had crystallised his thoughts on them in a series of addresses delivered in the United States, he determined to review the whole history of the relation between the religions of mankind and the newer knowledge which science has acquired. To make clear the steady progress which knowledge of natural phenomena is achieving, and its consequences to our beliefs and our social organisations, he has surveyed man's religious beliefs from their first dim dawning in neolithic or even palæolithic times, through Mesopotamia, Assyria, Egypt, Greece and Rome, to the rise of Christianity, Mohammedanism, and the great religions of the Eastern world. The studies of the archæologist, the anthropologist, the theologian, and the philosopher have all contributed to his theme, for Sir Richard Gregory is perhaps the nearest approach in our time to the scholars of the past who took all knowledge for their province. His book is of absorbing interest, though it is not always easy reading, partly because the main argument is sometimes obscured by side-issues, such as the chapter on "The Month, Easter and the Calendar." But when he strays from the straight path his divagations are so fruitful that it is easy to forgive him.

His last chapter on science and social ethics is a noble consideration of the difficulty caused by the rapid advance of the application of scientific discovery to human industry compared with what General Smuts called "our stationary ethical development." Scientific men have in the past lived too much in the laboratory, but they are citizens as well as scientific workers and can no longer remain indifferent to the social consequences of their own labours. "It would be a betrayal of the scientific movement," says Sir Richard Gregory, "if scientific workers failed to play an active part in solving the social problems which their contributions to natural knowledge have created."

Field Ambulance Organization and Administration

By Lieut.-Colonel JAMES HARDIE NEIL, late officer commanding No. 3 New Zealand Field Ambulance. London: H. K. Lewis. 1940. Pp. 128. 5*s.*

MANY small books have been written to guide field-ambulance officers in the diversity of their duties. Here is a good one. It contains both general principles, such as "if food suitable for any class of disease in the ambulance is not forthcoming for the patients, the fault does not lie with the army authorities, but with bad quartermastering arrangements," and details such as the contents of the field-ambulance panniers. These can only be learnt by experience and practice but Colonel Hardie Neil gives a helpful rhyming mnemonic for them. There are valuable pages on clerical work and lists of duties for the various members of the personnel. Every young doctor when he

joins up would be well advised to start at once the study of his duties in the field ambulance, to which he probably will be sent before the war is over. This book has been written for a field ambulance dug in during trench warfare and some of it does not apply to the mobile warfare of today, but most of its practical wisdom still holds.

Theory and Treatment of Fractures of the Jaws in Peace and War

By H. H. BOYLE, L.D.S. Glasg., H.D.D., late captain (D), Army Medical Service; dental surgeon to the Ministry of Pensions. London: Henry Kimpton. 1940. Pp. 288. 21*s*.

THIS book is based on the author's sphero-ellipsoidal theory of occlusal curvature of the upper teeth. He maintains that the curvature of the anterior teeth is ellipsoidal, and of the posterior teeth spherical. He disposes of the views of others with ease, but does not make his own any more easily acceptable, in spite of the use of algebraical formulæ. In any case these curvatures can have little application in fractures of the jaw, for it is usual to mould the jaw upon its counterpart, and it is unusual for both jaws to be shattered in the same patient.

The practical section of the book contains a review of the many methods that have been used in the past, with free quotations from other works, and from the memorandum of the Army Council on maxillo-facial injuries. Many of the illustrations are likewise from standard works. The author then continues to apply his theory to fracture cases, and recommends transparent splints made with the curvature constantly in mind. These are freely illustrated on normal models, and it is a pity that few of the author's own fracture cases are described, for it is only from these that the method can be appraised. The text is rather redundant and circumlocutory, and it is doubtful if the book will have much appeal to the practical dental surgeon, to whom these cases are rightly referred.

Handbook of Skin Diseases

By LEON H. WARREN, M.D., formerly instructor in dermatology, Temple University; assistant dermatologist, United States Public Health Service. New York: Paul B. Hoeber. Pp. 321. $3.50.

ANY attempt to compress the teaching of dermatology into a manual of this size must presuppose more than an elementary knowledge in the reader, and this book's value to the practitioner is further diminished by the absence of illustrations which have done so much to popularise the smaller textbook. The author has given clinical descriptions of over 200 dermatoses in what he calls "telegraphic" form. They could hardly be memorised, but he hopes they may provide the lecturer with an aide-memoire, and it is to this relatively small class that the book may prove useful. The brief descriptions are standardised under seven headings: etymology; synonyms and eponyms (e.g. Boeck's sarcoid, Darier's dyskeratosis follicularis); essential nature, which includes the "telegraphic" description of the disease, its ætiology and clinical varieties; diagnostic features, such as localisation and induration; histology; differential diagnosis; and finally three or four lines on treatment. Treatment is further considered in a complete section to itself which is mainly pharmacological, and teems with advice beyond the resources of all but the most modern dispensaries. In it the author shows an unusual acquaintance with the preparation and finer therapeutic effects of dermatological and cosmetic applications. He has a natural bias in this direction, and hardly touches on the use of radiotherapy. The volume is original within its limited scope and it will appeal to all who teach dermatology or who wish to refresh their memory about the differential diagnosis and nomenclature of some of its rarer manifestations.

Chirurgie réparatrice et correctrice

By L. DUFOURMENTEL. Paris: Masson et Cie. Pp. 407. $3.

THERE has lately been a stream of new books on plastic surgery, particularly from America and the Continent, and since there will shortly be a great demand for plastic operations it is important that the best procedures should be made known. M. Dufourmentel holds a high place in this branch of surgery in France, and his book covers the subject fairly completely, concentrating particularly on deformities of the face, including the nose, lips, jaws and ears. The book is illustrated by photographs of patients before and after operation, but the line drawings of intermediate stages might be more plentiful. Chapters are included on harelip and cleft palate—following closely the work of Veau—and on breast reduction. The procedures described are in common use on the Continent but differ in some respects from the practice here. Thus for eyelids full-thickness grafts are used rather than razor grafts. Flaps are taken from the neck for the cheek and from the cheek for the nose, often leaving unpleasant secondary scarring. The distant tube pedicle does not receive much attention although it produces such excellent results. Cartilage is used freely for deformities of the nose and eye sockets rather than bone. It is not clear how the lining is obtained in rhinoplasty. With these reservations the book is a welcome addition to the plastic surgeon's library.

Medical Annual, 1940

Edited by H. LETHEBY TIDY, D.M. Oxfd, F.R.C.P., and A. RENDLE SHORT, M.D. Lond., F.R.C.S. Bristol: John Wright and Sons. 1940. Pp. 604. 20*s*.

THE Medical Annual is more than a mere summary of important publications. The contributors, who are all authorities in their different fields, choose the subjects reviewed with discretion and give readers the benefit of their specialised knowledge with critical comments and helpful suggestions. In the new volume the sulphonamide drugs are discussed by R. St. A. Heathcote; the large number of communications on cystic diseases of the lung are reviewed by Maurice Davidson; and the present position regarding shock therapy in schizophrenia is lucidly presented by Aubrey Lewis. E. W. Hey Groves summarises the important information which has come from Spain about the treatment of war fractures and air-raid casualties, and also of much general interest today are the articles on the medical aspects of flying and the medical hazards of submarine crews by A. F. Rook and Macdonald Critchley. All the reviews are clear and concise and the many illustrations, some in colour, add greatly to the attraction of the book.

Synopsis of Regional Anatomy

(4th ed.) By T. B. JOHNSTON, M.D., professor of anatomy, Guy's Hospital medical school. London: J. and A. Churchill. Pp. 462. 12*s*. 6*d*.

THERE has been little change in the text of this edition, except in the section on the central nervous system, where some new and clear diagrams have also been inserted. The original high standard of the book has been maintained, and it can be recommended as before to students who want to polish up their anatomy before facing the examiner or want to keep it from getting rusty during their clinical work.

THE LANCET

LONDON: SATURDAY, JUNE 22, 1940

ANTITOXIN IN THE TREATMENT OF GAS GANGRENE

IT is generally agreed that early surgical excision of a wound is the best prophylactic against gas gangrene, but there are as yet no reliable data about the best means for the treatment of an established infection. Surgery must still play its part in the removal of gangrenous tissue, whether by amputation in the case of massive gangrene of a limb or by excision of a single devitalised muscle, though with adjuvant treatment the removal may not have to be so radical as in the last war. Controversy is likely to arise as to the relative importance of the sulphonamides and antitoxin. That antitoxin per se can save the lives of animals experimentally infected with *Clostridium welchii* or *Cl. septique* has already been sufficiently proved; none the less this method of treating the clinical infection has rather fallen into disrepute. The reasons are a little difficult to find. The only large-scale experience in the application of gas-gangrene antitoxin was that obtained towards the end of the last war with sera of very low potency when the results, both prophylactically and therapeutically, exceeded expectations. In civil practice since then antitoxin has been little used, and the disappointing results may have been due to too late administration or inadequate dosage. Be that as it may, there is little doubt that in this chemotherapeutic era clinicians are tending to rely more on the sulphonamides than on antitoxin for the treatment of gas gangrene—witness, for instance, a recent report by MCNEILL LOVE.[1] The experimental evidence in support of such an attitude is far from satisfactory. LONG and BLISS [2] obtained good results from the use of sulphanilamide in mice injected intraperitoneally with *Cl. welchii*. STEPHENSON and ROSS [3] reported similar results from small numbers of similarly infected mice treated with either sulphanilamide or sulphapyridine, while in mice infected with *Cl. septique* only sulphapyridine had some effect. The objection to these experiments is that the route and type of infection do not closely simulate the clinical disease, which is essentially a local infection of muscle accompanied by an intense toxæmia. Indeed, when STEPHENSON and ROSS injected mice intramuscularly they found that these two drugs had no effect on *Cl. welchii* infection and very little on *Cl. septique*.

The treatment of experimental gas gangrene with sulphapyridine alone (it was found to be much more effective than sulphanilamide) or in conjunction with antitoxin or antibacterial serum has now been tackled thoroughly by HENDERSON and GORER.[4] Using *Cl. septique*, the infecting dose of which could be accurately controlled, and the intradermal and intramuscular routes, these workers found that the drug alone was fairly effective in controlling and curing intradermal infection, but that even when given prophylactically and in continued dosage it could not save more than half the mice infected intramuscularly. Sulphapyridine had a slight but statistically significant action on intradermal infection with *Cl. welchii*, but none at all, even prophylactically, on intramuscular infection with the same organism; nor had it any neutralising effect on the toxins of either *Cl. welchii* or *Cl. septique*. On the other hand, antitoxin was spectacularly successful in saving mice even when given six hours after intramuscular infection with *Cl. welchii*. To test for a possible synergic effect between drug and antitoxin or antibacterial serum the more sensitive intradermal infection with *Cl. septique* was chosen, and the experiments were so designed that any of these agents, when used alone, would protect not more than 5–10 per cent. of the infected animals. The results were dramatic. Sulphapyridine plus antitoxin produced a survival-rate of 88 per cent., compared with 7–8 per cent. in the controls, while drug plus antibacterial serum was only slightly less effective (72 per cent. survivals). In contrast the combination of antibacterial and antitoxic sera saved only 15·5 per cent. of infected animals. In mice infected intramuscularly with *Cl. septique* one dose of antitoxin combined with continued administration of sulphapyridine raised the survival-rate from 0–20 per cent. to 70 per cent. This is a particularly important finding, since it points the way to a rational use of the two forms of therapy in clinical gas gangrene.

In the discussion of their results, HENDERSON and GORER are careful to point out that, particularly with *Cl. welchii*, there is considerable variation in the toxigenicity and invasiveness of different strains and that their results were obtained with single strains of *Cl. welchii* and *Cl. septique*. But there is no doubt that there exists a synergic action—the meaning of which is not sufficiently understood—between drug and antitoxin, for which the most likely explanation is that the antitoxin neutralises the bacterial toxin while the drug exerts a bacteriostatic effect on the organism itself; thus the body's natural defences are able to play their part in completing the destruction of the invader. In view of these results it would be unwise in any wounded patient in whom gas gangrene is diagnosed or even suspected to withhold treatment with polyvalent antitoxin. It should be given intravenously at the earliest possible moment and in adequate dosage —say, one therapeutic dose for the suspected case, and for the established case three to five doses combined with 6–9 g. of sulphapyridine daily until the infection is obviously controlled.

1. Love, R. J. McN. *Brit. med. J.* June 1, 1940, p. 908.
2. Long, P. H. and Bliss, E. A. *Canad. med. Ass. J.* 1937, **37**, 457.
3. Stephenson, D. and Ross, H. E. *Brit. med. J.* March 23, 1940, p. 471.
4. Henderson, D. W. and Gorer, P. A. *J. Hyg., Camb.* May, 1940, p. 345.

WOMEN AND THE SERVICES

IN the current issue of the *New Statesman* is a disquieting but well-documented article by Miss ELEANOR RATHBONE, M.P., on the waste of woman power. She points out that although in the last war women proved themselves capable of almost entirely staffing munitions factories, and even of playing a substantial part in the building of battleships, no real effort has yet been made for utilising their services in this desperate national crisis. Of 15,000 names on the central register of women suitable for administrative posts only 200 to 300 have been placed in employment since the war started, and of 5000 registrations of professional women at Bedford College only 40 were placed in May. For women over 35, except nurses, there is, she writes, practically nothing doing anywhere, no evidence that the field is being surveyed or that women are being trained for the supervising posts for which they will be needed if maximum production is to be achieved.

How far does this indictment apply to the medical profession? There is reason to think that with certain exceptions our record is considerably better than that of others. In private practice women are taking on a good deal of the work of men called to the colours. In the public-health services movement was slow to start with and the deplorable tendency to keep women, however widely qualified, in a pen labelled "Maternity and Child Welfare" brought its inevitable harvest of difficulties. For this the women themselves are in no way responsible; for some years the Medical Women's Federation has been trying to ensure that women assistant medical officers had more opportunities for broadening their experience and taking a share in administrative work to fit them for promotion. In this great emergency the reasons, not always very creditable, for opposing these suggestions are yielding to the national need. A few instances have occurred since the war of women medical officers being compelled to retire on marriage at a moment when shortage of medical staff in the neighbourhood was acute, but these anomalies are being rectified and the Ministry of Health will see they are not repeated. In one department, however, there is evidence of a prejudice (quite unknown in the last war) against the employment of senior medical women. Women officers have been appointed on very satisfactory terms to all the women's services, but to junior appointments only. It is manifestly impossible to construct a service satisfactorily without an administrative head and the longer such appointments are delayed the more difficult will efficient organisation become. When the late Mrs. CHALMERS WATSON was asked, early in 1917, to organise a uniformed service of women for the Army (the Q.M. A.A.C.), she planned at the outset for a special service of women medical officers, attached to the R.A.M.C., to supervise the health, hygiene and medical boarding of her corps. A chief woman medical officer, Dr. JANE TURNBULL, afterwards senior medical officer at the Ministry of Health, was stationed at the War Office with full powers to organise and administer the service under the D.M.S. and junior women administrative officers were appointed to command headquarters. A similar service for women of the W.R.A.F. was subsequently established with a chief woman medical officer at the Air Ministry. The W.R.N.S. had also a senior medical woman officer.

Far from interfering with or cutting across the duties of the R.A.M.C. or R.A.F. medical staff, it was freely acknowledged by the medical officers of those services that their women assistants relieved them of much important work for which they had neither the time nor the specialised knowledge. The needs of the women's corps were much less likely to be overlooked in times of pressure when they were dealt with by one person specially appointed for the purpose, for although attendance on the sick can usually be carried out acceptably by practitioners of either sex it would be strange if women had not a definite advantage in dealing with hygiene and accommodation and the medical boarding of women recruits. That complaints on all these points are much more numerous now than in the last war is probably not a mere coincidence. The medical examination of recruits is still, more than a year after the A.T.S. and W.A.A.F. were started, in a chaotic condition. It is said that in some areas no women doctors at all have been employed on this work. Owing to the lack of central control there is no means of collating experiences or of giving adequate instructions to examiners. There are now many thousands of women in the uniformed services and there seems to be no valid reason why their medical requirements should not be met at every point.

IS VITAMIN C STABLE?

IT has been rudely said that it takes years to get a discovery into the medical textbooks and the rest of time to get it out. Certainly the idea that cooking destroys the vitamins has taken firm root. Two years ago Mrs. BOAS FIXSEN [1] wrote that the ordinary processes of cooking are unlikely to cause any significant loss of carotene, vitamins A or B_1, the B_2 complex, or vitamin D, her only proviso being that riboflavin was much diminished by heating or canning in an alkaline medium. There remains only vitamin C to be considered. The instability of this vitamin is notorious, but has been much exaggerated. In 1919 the committee on vitamins appointed by the Medical Research Council and the Lister Institute remarked [2]: "Seeing that the antiscorbutic accessory factor is sensitive to high temperatures, it is clear that the value of fresh vegetables and fruit must of necessity be greatly impaired by cooking." This opinion was repeated almost verbatim in the new report of the committee issued 13 years later,[3] but since then a mass of data have accumulated to show that cooked and canned fruits and vegetables retain a fair proportion of their vitamin. After all, BARLOW used to cure infantile scurvy with baked potato, and frank scurvy appears in Great Britain and Ireland

1. Boas Fixsen, M. A. *Nutr. Abstr. Rev.* 1938, **8**, 281.
2. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 38. 3. *Ibid*, No. 167.

only when the potato crop fails, so that many people must be getting much of their anti-scorbutic material from the boiled potato.

Part of the destruction described by earlier workers was really a solution of vitamin C in the water used in boiling the comestibles. With stewed fruits this does not matter, for the juice is consumed as well, but with vegetables vitamin C dissolved out is a complete loss unless put into the stockpot. None the less, according to OLLIVER,[4] a helping of 3½ oz. of brussels sprouts may contain at least a day's requirement (30 mg.) of vitamin C. The same is true of spinach and asparagus tips, boiled or canned, and new potatoes may contain a third of a day's ration in a helping. Among the fruits cooked or canned blackcurrants have between three and five days' rations per helping, red currants one or two, gooseberries half a ration, loganberries two-thirds to one, and strawberries one or more. Lately OLLIVER, in some unpublished work,[5] seems to have disposed of the view put forward by HARDEN and ZILVA [6] in 1918 that if soda is added to the water when boiling greens most of their vitamin C is destroyed. Cookery books now suggest other more or less satisfactory ways of keeping the colour, such as leaving the lid off so that the volatile sulphides which discolour the chlorophyll can escape, or adding sugar or butter. But if OLLIVER is right, and his figures leave little doubt that he is, the housewife may keep her greens really green with soda with a clear conscience.

All this makes it clear enough that vitamin C is not as sensitive to heat and alkali as we had long supposed. Nevertheless it is relatively unstable. Prolonged "keeping hot" or reheating, which is unavoidable in canteens and restaurants, may make fruits and vegetables nearly useless as antiscorbutics. To be on the safe side, then, we should eat our fruit and vegetables freshly cooked and supplement them liberally with others in the raw state.

SOLDIER'S DOCTOR

WHEN any qualified medical man becomes attached to a field ambulance he assumes the functions of a soldier, an officer and a doctor. As a soldier he must know something about tactics in order to understand what the troops with which he is serving are doing and in order that he may reach them when they need his help. He must be able to read a map, find his way by day and in the dark, and have some eye for ground. As an officer he has men under him whom he must care for and command; he is responsible for their billet, their equipment, their clothing and their health. For the last he must see that they get sufficient food and adequate rest. He must watch them to know whether they are at breaking point from over-work, whether they are going stale from excess of training, or getting tired and out of hand through not having enough to do. He must know about the organisation and administration of the Army in order to obtain for his men all that is needed for their mental, moral and physical health, and the materials for them to do their work. As an officer he also has to teach them what they do not know, and to practise them in what they do—the twin essentials of training which must never cease. When he has done all this he is entitled to expect them to carry out any order he may give. He is not then likely to give one that will be disobeyed.

As a doctor he must have a wider outlook upon the practice of his art than in any other sphere of life. He has to advise himself as an officer on all matters concerning the health of his men; he has to advise himself as a soldier of any attempt to go beyond the physiological power of the human being; under the commanding officer he has to take his share in the sanitary and preventive medicine of the unit as a whole; he must be prepared to be drafted, for a time or for good, to any unit in the formation with which his field ambulance is serving, where he will have to carry on not under a medical man nor with fellow medical officers but as adviser-in-chief in all medical matters to a lay commanding officer and the lay officers under him. No wonder an experienced brigadier said that the members of the medical services were the most powerful people in the British Army when they used their knowledge properly. And with all this he has his duties as a clinician. He must know how to treat every minor disorder, and, how to hold his hand in the presence of lesions, of the body generally and of its special parts such as eyes, ears and skin, with which he is not competent to deal. He must have the wit to suspect every kind of medical diseases, including the acute infections, and a number of tropical diseases. He may be called upon at any moment to do some minor surgery passing well or to give an anæsthetic in emergency. Finally he must be a good natural psychologist, able to interpret the motives behind the complaints and to decide which need firmness and which compassion, kindly to all and showing his sympathy whether he sends a man back to his unit or tucks him in an ambulance on his way to Blighty. And when he gets there our correspondent Pertinax makes the same call on the essential qualities of the soldier's doctor.

4. Olliver, M. *J. Soc. chem. Indust.* 1936, **55**, 153 T.
5. Cited by Callow, A. B. Food and Health, Lond. 1938, p. 55.
6. Harden, A. and Zilva, S. S. *Lancet*, 1918, **2**, 320.

THIS war moves so rapidly that a new suggestion today is a discarded practice tomorrow. The Dominions have invited us to send children from England overseas until this country is safe for them. A meeting of the National Baby Welfare Council held on June 15 was strongly in support of the principle and urged the Government to proceed with the scheme on a large scale and as quickly as possible. In a letter to the *Times* of June 17 responsible officers of the Society for the Overseas Settlement of British Women offer the machinery of their organisation to carry out the migration. The society has many years' experience of sending women and children overseas to the Dominions. A government committee is already considering Canada's offer to receive and educate several thousand British children and the Board of Education has circularised local authorities on the subject. The children would be absorbed into Canadian schools, each province taking an allotted number. There is probably still time to make use of this valuable opportunity.

ANNOTATIONS

SACCHARIN'S OPPORTUNITY

THE minor correspondence column of the *Times* has lately been enlivened by a controversy on saccharin, beginning with Mrs. Marie Stopes calling it a subtle poison and ending with an octogenarian saying he has taken it for 25 years without ill effects. Dr. Stopes's charges, though unsupported, may have made the user pause before dropping a tablet into his tea. In fact, there seems to be no real evidence that saccharin in reasonable doses does any harm, though in large ones it is said to upset digestion, as might any condiment taken in excess. In 1911 the United States Department of Agriculture carried out a controlled experiment on 12 Harvard medical students, 7 of whom took gr. 2½–12 a day for five months and kept in as good health as the other 5 who took sugar. A much larger though less scientific experiment has been carried out by the great body of mineral-water addicts and diabetics, who between them have consumed some tons of saccharin, consciously or unconsciously, without damaging their digestions. Those who like their tea sweet can therefore try saccharin without qualms, though they may find themselves slowly preferring their cup unsweetened. If they object to the occasional bitter after-taste, produced by a particle of undissolved saccharin left on the tongue, they should try one of the solutions or elixirs that are on the market, in which the solubility of the saccharin is increased by combining it with sodium bicarbonate. Just now a more urgent question is how far saccharin can be used instead of sugar in jam-making, for it seems unlikely that the Minister of Food will allow any extra ration for preserving the soft-fruit crop. Recipes for sugarless jams are given in diabetic cookery books, and apparently the results are not unpalatable. The necessary consistency is given by the addition of gelatin. In one such recipe the constituents are 1 lb. raspberries, gr. 16 saccharin and ½ oz. powdered gelatin.[1] It is apparently wise to add the saccharin, dissolved in a little hot water, after the fruit has been cooked, since long boiling may reduce its sweetness. Saccharin seems, however, to be reasonably heat-stable, since it is used in making diabetic biscuits and even by some makers of ordinary biscuits to prevent the wafer sticking to the heating plate. The objection to sugarless jams is their poor keeping qualities after the pot is opened, and the diabetic recipes all advise the use of small pots for this reason. This difficulty could, however, be overcome by the addition of a preservative such as benzoic acid. With a little hasty research on these lines cookery experts should be able to evolve recipes which will satisfy the average palate and prevent our soft fruits from being left to the birds.

POLYPS OF THE COLON AND RECTUM

THE relationship of polypi of the large intestine to malignant disease is now so well known as not to require special note, but several points of value have been brought out by Phillips and his colleagues[2] of the Mayo Clinic. They first refer to the statement of L. I. Dublin that out of 160,000 annual deaths from cancer in the United States some 30,000 (17 per cent.) are from cancer of the colon and rectum. The incidence is therefore second only to that of cancer of the stomach, and exceeds that of cancer of the uterus and breast, which come third and fourth. In the surgical treatment of carcinoma of the colon it is well to remember that a polyp in the precancerous stage may coexist in another part of the colon at the time of operation, or may develop subsequently. Hence the remainder of the colon should be carefully palpated before a part of the colon is removed, and even after a successful resection there are grounds for advising a periodical re-examination including an air-contrast radiological study. The discovery of polypi in the rectum by digital and sigmoidoscopic examination opens up a number of possibilities. The family history will tell us whether the condition is likely to be the hereditary type of polyposis in which carcinoma is almost certain to develop early. If irregular mucosal tags are seen the polypi are likely to be due to a severe chronic ulcerative colitis, and Bargen considers that adenomatous change may take place in these tags to be followed eventually by the growth of a low-grade carcinoma. In other cases when the inflammatory disease is very destructive there may follow an uncontrolled state of repair and the development of a diffuse carcinoma of a high grade of malignancy; this is prone to occur in subjects under thirty, the growth being rapidly progressive and inevitably fatal. The conclusion which C. F. Dixon arrives at is that all polypi of the rectum and colon must be considered as precancerous lesions and should be removed. Those within reach of a proctoscope and sigmoidoscope can usually be destroyed by fulguration, for which a number of ingenious instruments are now available. Hæmorrhage in these cases may be somewhat difficult to control and may necessitate admission to hospital. Polypi of the colon constitute another problem, and radiography will help in determining whether they are single or multiple. The simplest procedure in the case of a solitary pedunculated polyp is to excise it locally, but if it is sessile a more radical operation such as segmental resection is required.

THE RAY FUNGI

ACTINOMYCOSIS is rather rare in mankind but more common in animals, especially in cattle and pigs. In animals actinomycotic-like lesions are most often found in soft tissues, such as the tongue and udder, and in these cases the infecting organism is usually an aerobic gram-negative actino-bacillus; infection involving bony structures is, like human actinomycosis, almost always caused by anaerobic streptothrices. Because of the strictly parasitic nature of these pathogenic anaerobic actinomyces, the one-time belief that in the human disease the streptothrix was carried in by oat or barley seeds or bits of straw has been discarded, although these agents probably favour infection by causing laceration of the mucous membrane. There is still the possibility that man may be infected from domestic animals, and it is important to know if the human and animal pathogens are biologically identical or not. Miss Dagny Erikson[1] has concluded from a detailed bacteriological examination of some 20 strains of pathogenic anaerobic actinomyces (15 of human origin and 5 from cattle) that the human strains are clearly distinguishable on cultural and serological grounds from the bovine. Colonies of the bovine type are smoother and softer than the human variety, and do not adhere to the medium; growth is very poor and the mycelium readily breaks up into diphtheroid

1. See Weight Reduction—Diet and Dishes. By Dr. E. E. Claxton.
2. Phillips, R. B. *Proc. Mayo Clin.* February, 1940, p. 97.

1. Pathogenic anaerobic organisms of the actinomyces group. By Dagny Erikson. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 240. H.M. Stationery Office. 1940. Pp. 61. 1s.

forms; turbidity may occur in liquid media. But this bovine type has occasionally been isolated from human lesions just as the human type has from animals, particularly pigs, and these facts, together with the greater frequency of infection among those in intimate contact with domestic animals, must still leave as an open question the possibility of spread of infection from animals to man. It may be significant that 8 of Erikson's 15 human strains were derived from patients in the London area. That the human lesion is often due to autogenous infection with anaerobic actinomyces present in the alimentary tract is now generally accepted, and it is a pity that Erikson was unable to include strains from uninfected persons in her series.

Erikson is an advocate of Ørskov's technique of microscopic examination of living cultures growing on the surface of solid media as the best means of studying the morphology of the streptothrices and has shown that the anaerobic strains may even develop aerial hyphæ as the aerobic species do. The diphtheroid forms commonly seen in stained preparations result from the easy fragmentation of the mycelium, and have been the cause of much confusion and even mistakes in diagnosis. Whether the micro-aerophilic character of this group is due to the need for diminished oxygen tension or increased carbon-dioxide pressure is left unsettled; the zone growth in shake cultures suggests that the latter is the more important. No evidence for a filtrable form of the actinomyces was obtained. Serological typing of these organisms is extremely difficult owing to their poor growth and great granularity, and it is to Erikson's credit that after much painstaking and careful work she was able to classify the human strains into one homogeneous serological group, with no apparent affinity for the bovine species or the aerobic actinomyces. In discussing taxonomy, she suggests that the common human strain should be called *Actinomyces israeli* and the corresponding bovine strain *A. bovis*, while the aerobic actinomyces of Bostroem should, as suggested by Topley and Wilson, be named *A. graminis*.

WHAT TO EAT IN WAR-TIME

So far our appetite for news bulletins has not destroyed our appetite for dinner. The Ministry of Food and the housewife are anxious to see that between them we get a nourishing diet at the table to fortify us against any kind of news. The doctors have come to the help of the housewife in a cheerful pamphlet published by the British Medical Association[1]; this gives the advice of a committee of experts on diet in relation to rationing, and has, besides, very good pictures by someone who signs himself J. H. When the housewife has looked at all the pictures, especially that of the cow mistakenly taking only one kind of food at a meal, she will have time to read the text and will find it really helpful. There are no technical terms but much technical information so simply and adroitly set out that it need alarm no-one. Foods are grouped as body builders, body warmers and protective foods; substitutes for rationed foods are suggested, and some notes on particular foods, near the end; answer most of the questions the housewife has been asking herself about substitutes. She is assured, for example, that manufacturers of margarine have undertaken to add vitamins A and D, up to the level found in summer butter, to all margarine sold during the war; that syrup and treacle are better than refined sugar because they contain lime and iron; and that there is no difference between the food values of fresh killed, and chilled or frozen meat. The potato and the herring are given their just due; rabbits and offal are called to mind, and cheese excites the enthusiasm it deserves. It is a handy little pamphlet which ought to get into the English home as soon as possible.

1. The Doctors tell you what to eat in war-time. Price 3*d*.

BERKELEY MOYNIHAN

Dr. Donald Bateman has essayed the difficult task of writing the life of Lord Moynihan[1] only four years after his death. He has collected facts which will be a store from which future writers will draw, but he does not give us a balanced picture of this remarkable man. Like most who came much under Moynihan's personal influence, his judgment has been subjugated so that in his eyes his hero could do no wrong. The foibles and the weaknesses of great men, from which none are free, do but show off their greater qualities. How much more human Moynihan would seem had they been allowed to obtrude a little more into this account of one who was held in affection by rich and poor alike. At his funeral thousands of mourners lined the streets of Leeds, a sure sign that Moynihan did not keep so completely aloof as many who met him casually were inclined to think. But the book does bring out the main facts. Moynihan had great ideals to which he adhered, he had an unusually good memory, he had a splendid physique, untiring energy, and was handsome to look at; but above all, he had an engaging and powerful personality which enabled him to influence others to help encompass his ends.

An effort is made in the book to prove that his greatness was the direct result of his heredity. He came of good stock, but there is no getting away from the fact that he was a biological sport. He became a surgeon almost by chance, as the result of a sudden impulsive emotional decision. A whim, affection for his mother, an impish delight in doing unexpected things, all seem to have played their part in causing him to abandon a military career for that of the doctor. But as he passed through his apprenticeship that calling gradually gripped him and held him fast. He had all the qualities of a successful surgeon. He became rich, and was ultimately honoured as only Lister had been. Yet he never lost his ideals in the attainment of his ambitions. He really did want to improve the general standard of surgery. It is true to say that this one man, more than any other, raised the quality of surgery performed in every operating-theatre in the land. He was not only a superb technician himself, but his great powers of oratory enabled him to instil the principles of his methods into others with enduring effect.

He could always get things done. During the war of 1914 when he visited America to advise the Army Medical Department in its preparations, he accomplished more than any other envoy could conceivably have done. He was so popular that, after the war, there was some talk of his going as ambassador to that country. When he became president of the Royal College of Surgeons, he did more to bestir that august body than any president from its very beginnings, and rescued it from being a mere examining body and the custodian of the Hunterian museum and library. He made it a living research unit, and in doing so forced it to be true to its traditions. He reinfused it with the true Hunterian spirit.

He was aloof and vain, but upright and true to his ideals. He did not smoke and drank but little alcohol.

1. Berkeley Moynihan, Surgeon. By Donald Bateman. London: Macmillan and Co. 1940. Pp. 353. 12*s*. 6*d*.

He had few intimate friends amongst men. He worked apart and apace and must needs be alone. He was curiously unresponsive to the appeal of pictures and music, but he loved fine words and good literature. The contemporaries of a great man can seldom guess the place that history will assign to him, but it is fair to say that Moynihan will always be a milestone in British surgery.

EXPERIMENTS ON SOIL FERTILITY

THE growing of plants without soil, which was discussed in these columns on June 1, seems to have demonstrated that vegetables of normal quality and dietetic value can be produced by supplying the plant solely with inorganic salts in watery solution. Yet the belief that vegetables grown on a "fertile" soil are more nutritious than those grown on a poor soil supplied with artificial fertilisers is firmly held by one school of medical and agricultural opinion. The experiments of Sir Robert McCarrison in India, when he fed rats with the diets of different peoples, have been widely adduced as proving the importance of a diet rich in fresh plant products grown on soils of high fertility. According to this view the difference lies in the absorption by the plant roots of organic substances, as yet unspecified, derived from the organic material in the soil or from the mycorrhiza shown to be associated with root systems on such soils. Some support for these views has lately come from New Zealand,[1] where all the farms are manured by chemical fertilisers. In 1936 Dr. G. B. Chapman, of the Physical and Mental Welfare Society of New Zealand, persuaded the authorities of a boys' school hostel to grow their fruit and vegetables on soils treated with humus. This has since been done, and a striking improvement is reported in general health and physique, particularly as regards freedom from infections, alimentary upsets and dental caries.

A brave attempt to decide this question is being made by Lady Eve Balfour, the moving spirit in the formation of the Haughley Research Farms experiment. An area of 236 acres in Suffolk has been acquired by the trustees and is to be divided into two approximately equal units. Each unit will be farmed in as nearly identical a way as possible, except in the matter of manuring. One unit will be treated with complete dressings of artificial fertilisers, organic matter being supplied only by ploughing in green crops. The other will receive only humus, manufactured from the waste products of both farms by the Indore process of Sir Albert Howard. As far as possible the crops on each unit will be grown from seed raised on that unit, and the stock on each fed from the produce of that unit. If the experiment confirms the superiority of the humus unit an attempt will be made to carry the experiment into the human field, selected families being chosen who are willing to submit themselves to feeding tests with the produce, vegetable and animal, from the two units.

Whatever its result, it is doubtful whether this experiment can give an unequivocal answer to the problem set. It is claimed that the only difference between the two units will be in the manuring and by implication therefore in the nutrition of the plants grown. But the crux of the matter lies in the plants' water-balance. In a "fertile" soil the colloidal organic material—humus or whatever it may be—has great water-holding capacity, and plants grown in such soils can derive that steady supply which they so vitally need. On a "poor" soil it is water-deficiency as much as nutrient-deficiency that limits growth and destroys quality. Herein lies the explanation of the success in growing plants in a nutrient solution; the water-supply is under control. Unless, therefore, in the Haughley experiment some means can be employed to ensure that the water-supply to the plants is equal and adequate in both units the results must be inconclusive. Nor is such an elaborate experiment essential. An early and convincing answer to the problem could be obtained if vegetables were grown by the sub-irrigation soilless cultivation method and others on a "fertile" soil and controlled feeding experiments were conducted on rats with the produce.

1. See *Nature* June 8, 1940, p. 905.

RESEARCH ON WOUND HEALING

THE speed at which a wound heals depends on a large number of variables. These, to quote but a few, include its site, extent, depth, and degree of raggedness, the apposition of the divided tissues and the factor of infection. Hence the assessment of claims made for substances or methods which accelerate healing presents considerable difficulty. The vast majority of claims rest on clinical impression, which has a tendency to develop into personal preference, and the way in which fashions change and recur as to antiseptics, dressings, irrigation or other treatment of wounds is some indication of the complexity of the problem. When war broke out it was decided at the Strangeways Research Laboratory at Cambridge to replace most of the purely academic work by studies of wound healing and to test on animals the various new methods of treatment which are being tried clinically. In addition, investigations are being made into the biological mechanism by which successful methods act. The essential preliminary to such experimental work was the elaboration of a method for producing and measuring standard wounds in lower animals, and this has been done. Otherwise only preliminary results were available when the report for 1939 was published. Experiments at the laboratory have, however, confirmed the beneficial action of urea on wounds which involve muscular tissue. The work being done should provide valuable information for the committee on wound healing that has been set up by the Medical Research Council.

FOR. MEM. R.S.

Dr. Peyton Rous of the Rockefeller Institute for Medical Research who, with the Duc de Broglie, Prof. R. G. Harrison and Prof. G. N. Lewis, has lately been elected a foreign member of the Royal Society, is distinguished for his versatility and the ingenuity and boldness of his use of technique. He is both a physiologist and experimental pathologist. His physiological work includes attacks on problems concerning the fate of blood-cells and preservation of blood; the reaction of tissues to injury; the permeability of blood-vessels and disease of the liver. He was responsible for a technique which opened the way for experiment on the peripheral lymphatic system in mammals, and himself made important observations on the flow and turn-over of lymph. The discovery for which he is best known is the transmission of cancer in fowls by a cell-free filtrable agent. Experiments published more than thirty years ago broke ground for all subsequent work on these minute agents. In recent years his belief that they are the nearest approach to the cause of cancer which has yet been found has been strengthened by experiments with a virus derived from papillomas of wild rabbits. This virus when inoculated into domestic rabbits produces true carcinomas.

SPECIAL ARTICLES

AN EXERCISE IN A.R.P.

A SKELETON routine to be followed during air-raids always looks very well on paper, but practical exercises show that though the general plan is clear in everybody's mind the details are not, and prove to be much more hampering than anyone expected. In our last issue a general plan for dealing with an air-raid incident was set out in a leading article; working on this broad pattern it is not difficult to make a clear table of duties for everyone engaged. An experienced medical officer in a small town found that an exercise conducted on broad principles, but without specified duties for individual A.R.P. workers, led to confusion and delays; but that a second exercise in which every worker had been given a clear programme was precise and successful.

FIXED FIRST-AID POSTS

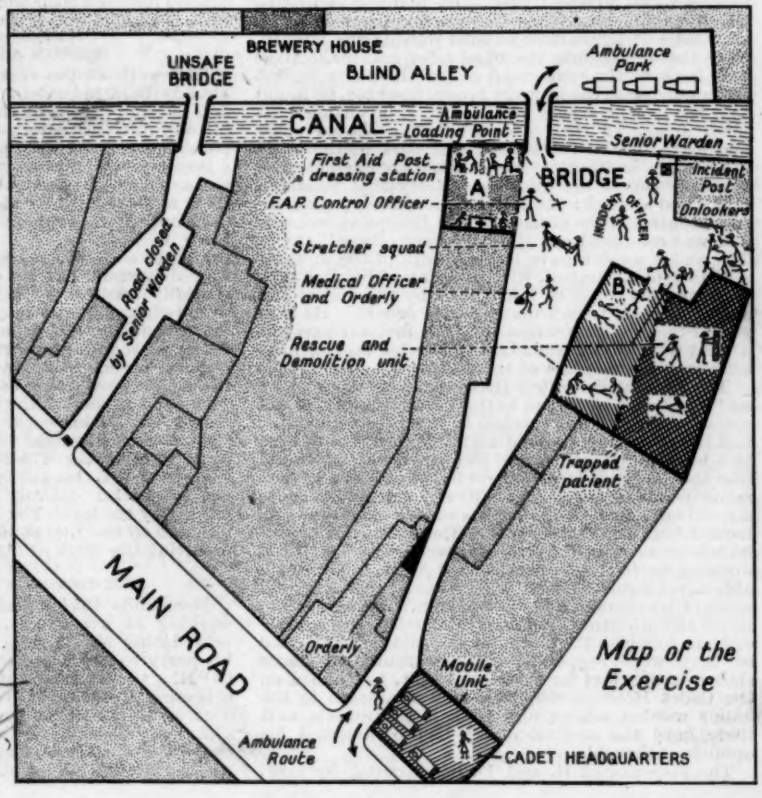
In his town fixed first-aid posts have been established in congested areas. Following a surprise raid, or in early raids before the public learn to make full use of cover, a large number of lightly wounded casualties can be given treatment at these posts, or shelter pending treatment. Many of those injured within half a mile of a first-aid post will be able to get to it by themselves.

Two of the posts are situated near hospitals; as it is likely that there will be a natural flow of casualties in these neighbourhoods, the posts will relieve hospital congestion. Mobile first-aid units have also been organised, but the scope of treatment at a fixed post is wider than that of a mobile unit because permanent hot-water supplies and appropriate lighting can be arranged beforehand. Moreover, if the local hospital reception unit is damaged or overworked the fixed posts can be used as temporary reception units and a member of the hospital staff comes over to select cases needing urgent treatment.

MOBILE UNITS

It would be ideal to have one mobile unit to every fixed post. At present the units are not based on hospitals as they should be, and their staff is almost completely made up of part-time voluntary workers, many of whom live a mile or two away from their base; this means that they could not get to the unit during an air-raid in time for an early call. The unit ought to be ready to go into action as soon as it is called and it would be better to have a smaller personnel than the regulations allow provided it included a higher proportion of trained full-time workers. The staff of choice would consist of a doctor in charge of one trained staff nurse, five junior nurses and two trained male orderlies. In danger areas a minimum of four members should be on full-time duty and employed at one of the local hospitals. On the "yellow" warning the unit would assemble at the appointed hospital. If the doctor in charge was not available when the call came in, another member of the hospital staff might be able to act as his deputy. Actually, a plan has already been made to provide extra medical help if it is needed. Medical officers in charge of first-aid posts have been told to stand by after an air-raid, with an orderly, an emergency bag and a car at hand. If their posts are not called into action they can be directed by central control to the area in which the incident has occurred either to take charge of the mobile unit or to help with evacuation.

The doctor, like everybody else, has to have his duties clearly defined. He need not see all casualties at an incident when there is a hospital within easy reach; indeed, if he did he would delay treatment, sometimes seriously. Nor can he operate and supervise cases within the mobile unit if, at the same time, he is expected to see all cases before evacuation. He has a chance to see casualties and make suggestions for their evacuation while his own unit is getting ready to receive cases, but after that he must leave evacuation to the first-aid post officer or to another medical officer dispatched from central control. It is sometimes suggested that all casualties should be seen by the doctor before they are moved so that they can be treated for shock if necessary; but shock cannot be treated effectively on the spot and the patient will be better served if he is carried straight to the ambulance, instead of two or three hundred yards to the mobile unit. Lifting and moving, with increase of shock, are inevitable either way, but it seems better to postpone treatment until it can be given without interruption under hospital conditions.



The task of loading ambulances is carried out from the dressing-station established by the first-aid post. This station also acts as a clearing-house where cases can be selected for treatment by the mobile unit and where first-aid treatment can be supervised. In some cases the first-aid dressing-station and the mobile unit may be lodged in the same building, but in most cases the dressing-station can be placed nearer the main incident than the mobile unit, thus saving stretcher carriage.

STAGE MANAGEMENT

The successful exercise is illustrated by the accompanying map. It was assumed that a ruined factory site had been partly destroyed by a high explosive bomb; in the cross-hatched area the building had collapsed completely; elsewhere the roof and first floor had begun to collapse. All entrances, except the one shown on the plan, were blocked, and a large iron girder had fallen completely across the doorway preventing stretchers from being taken into the building. The rescue and demolition unit (R. and D. unit) had to clear the entrances and shore up the floor. Dummies were used to represent casualties. The mobile unit was able to open up in the building marked Cadet Headquarters, a large well-built house with a permanent caretaker, good lighting and water supply and easily accessible doors and exits. The duties allotted to the various workers engaged in the exercise are best illustrated by an account of their activities.

A.R.P. UNITS IN ACTION

The local warden, first to arrive at the site of the disaster, reported the damage to a central control body, and the senior warden, coming quickly to the scene, heard the details of this report and took over from him. The police had not yet arrived, so the senior warden, having inspected the entrance to the factory and found it highly dangerous, sent all onlookers to an adjacent yard. He planned at first to let the ambulances come through the bottle-neck by the Cadet Headquarters to load outside the factory, cross the bridge into the blind alley and make their way back to the main road across the other bridge. On enquiring at the brewery house, however, he found that the second bridge was unsafe, so he changed his plan, arranging that the ambulances should enter and leave by the bottle-neck and park in the blind alley while waiting to be loaded. To prevent mistakes he closed the other road. By that time the police had arrived; the senior police officer took complete control of the situation from this point onwards and was referred to as the "incident officer" (I.O.). The senior warden gave him a record of the message sent to central control, withdrew any of his own men whose duties could be taken over by the police, and stayed himself to act under police orders. He suggested that his men might help the first-aid party as a stretcher-bearing squad, and put his special messenger at the disposal of the police.

The senior police officer (I.O.) began by establishing an "incident post" close to the damaged building and marking it with a flag checked in pale blue and white; had the raid taken place at night, he would have used two blue lamps, one above the other. He next got into touch with central control by telephone and then made what arrangements still seemed necessary to direct traffic and clear the area of onlookers, now all herded together in the yard. He looked for a protected area where the first-aid party might set up a dressing station, choosing the shed A, where the available cover would be equally welcome against a second wave of bombers or a shower of rain. He also established an ambulance loading point outside the dressing-station, to which the ambulances could be summoned as they were required. Looking round for more elaborate quarters for the mobile unit, he decided on the Cadet Headquarters and sent a message to the senior warden asking him to halt the mobile unit there until the medical officer had been asked his opinion of the site.

The inspector of R. and D. had arrived by now. The I.O. described the situation to him and proposed forming a stretcher-bearing squad to bring casualties from some point inside the building (the area B was chosen) to the dressing-station. The first-aid party had just appeared and were told that they could not enter the factory until the R. and D. unit gave the word; they were directed to A to set up their dressing-station. Ambulances arrived and were sent by the I.O. to the blind alley to await loading. Meanwhile the inspector of R. and D. had sent a message to say that he wanted the special acetylene cutting apparatus, to remove the girder from across the door; the I.O. sent a messenger to central control to fetch it. The first-aid post control officer (F.A.P. officer) now arrived and was told to take charge of the first-aid organisation, to report progress and to ask for any help he wanted. These officers are senior members of the F.A.P. organisation, one being stationed at each depot and holding himself ready to go to the scene of an incident on orders from central control.

ARRIVAL OF THE MOBILE UNIT

At this point the medical officer of the mobile unit came upon the scene, accompanied by an orderly with the emergency bag. The I.O. received him and suggested the Cadet Headquarters as a site for his unit. The doctor agreed and the I.O. sent a message to the unit asking them to open up there as quickly as possible and to report when they were ready. As more ambulances came rolling in the F.A.P. officer was informed.

The R. and D. inspector sent out a message to say the factory was now safe for stretcher-bearers, and the I.O. relayed the message to the F.A.P. officer. He now had time to send round for a few reports on progress, receiving one from the medical officer, who had gone into the factory, one from the inspector of R. and D. and, later, one from the F.A.P. officer on the progress of evacuation. He remained in charge until all officers reported their work complete, when he notified central control and returned to his station.

RESCUE AND DEMOLITION

The work of the rescue and demolition unit has already been indicated. After reporting to the I.O. and hearing details of the damage, the inspector cut his way into the factory and formed his men into two parties—a small rescue party of one or two men, and a larger party for construction and demolition. The rescue party had the task of searching for casualties; they noted especially those so dangerously trapped that only immediate release could save their lives, those trapped but not needing immediate release, those not actually trapped but injured in such a way that they could not get out of the debris, and those partially trapped by a limb under debris which it would take many hours to remove; the single casualty in the last group was shown to the medical officer as soon as he arrived in order that he might perform an emergency amputation if he thought fit. Casualties were being assembled at B by the rescue party and as soon as the building was sufficiently safe the R. & D. inspector notified the I.O. that the stretcher squad might come in. The medical officer came in with the F.A.P. officer and made a quick survey of the casualties, ordering morphia where necessary and dealing immediately with the one pinned by the leg. The R. and D. inspector reported progress to the I.O. at intervals and finally left after reporting the work of his unit to be complete.

THE FIRST-AID DRESSING-STATION

Meanwhile the first-aid party had been steadily working at evacuation. The F.A.P. officer, after establishing his dressing-station, instructed some of his party to get ready to enter the factory and help the R. and D. rescue squad to bring casualties to the collecting point, and to give first-aid. He also organised, with the help of the I.O. and senior warden, a stretcher-bearing squad to bring cases from B to the dressing-station; wardens and onlookers were used as stretcher-bearers. After the mobile unit had

been opened the control officer saw all cases at the dressing-station and directed which were to be put into the ambulances at once and which sent to the unit. The ambulances when summoned drew up at the agreed loading point; when any delay occurred the F.A.P. officer notified the I.O., and he also kept him informed of the progress of evacuation. When the factory was reported to be clear of casualties, he made a final inspection to assure himself that no-one had been missed and reported that his work was completed to the I.O. and the doctor.

WORK OF THE MEDICAL OFFICER

The medical officer, while still in the factory, investigated the condition of such casualties as he could find and gave the F.A.P. officer the necessary instruction about priority of treatment and evacuation. He then decided to free the casualty who was trapped by a leg, as the leg was already severely crushed and it was unlikely that he could be released from the debris for some time. An emergency amputation was performed on the spot, with the aid of his medical orderly. Meanwhile he was informed that the mobile unit was open and ready to receive casualties. He returned to the unit, inspected the arrangements and got ready to operate; after which he worked on the cases sent in from the first-aid post, getting them ready for transfer to hospital. There is no time, in such an emergency, to perform any advanced wound toilet—to remove fragments of shell or excise the wound—even if it were desirable. In any case it is dangerous to remove foreign bodies without excluding additional fragments by screening; and good lighting and full equipment are needed for the safe debridement of wounds. Primary suture should be reserved for clean incised glass cuts, and other wounds can be packed with flavine gauze to prevent hæmorrhage and left for further treatment in hospital. The doctor notified the I.O. when he needed ambulances, and when the work of the unit was complete.

GROUPING THE CASUALTIES

The cases regarded as suitable for treatment by the mobile unit fell into three groups: those who would obviously benefit from immediate surgical operation or toilet; those whose condition was so unsatisfactory from shock or collapse that the F.A.P. control officer thought them unfit to be removed by ambulance before they have received temporary treatment from the doctor; any minor cases.

In the exercise described, the cases in the first group included a compound fracture of the upper end of the left femur with uncontrolled arterial bleeding; a large open wound of the chest wall, with air sucked in during inspiration; and an abdominal wound with bowel protruding. The second group, less obviously serious and much more difficult to assess, included a patient suffering from internal hæmorrhage with abdominal pain, a small wound in the region of the liver, thirst, pallor and a rapid, feeble pulse; a case of compound fracture of the skull with brain protruding, shallow irregular bleeding and a poor pulse; and a third patient who was unconscious with blood on the lips and an imperceptible pulse. Unconscious patients whose colour and pulse were good were loaded into the ambulance without ado.

FITTING THE PLAN TO ANY INCIDENT

The plan followed in this exercise can be made to apply to an incident in any area. The first duty of any new person coming on the scene is to seek the incident post and get into touch with the I.O. who will direct him to his proper station. Any doctor who comes to the scene spontaneously will be asked to go to the mobile unit to receive instructions from the medical officer in charge. He will probably be most useful at the ambulance loading point, checking and classifying casualties and deciding on their initial disposal, or in the dressing-station, helping to treat them.

In areas where no mobile unit is available, casualties needing urgent treatment are assembled at the first-aid dressing post and taken by ambulance either directly to the hospital or to a fixed first-aid post.

MEDICINE AND THE LAW

Standards of Insanity

PERHAPS the main difference of opinion between medical and legal practitioners arises over the rigidity of the legal standard of insanity in relation to crime. An allied difficulty is the different standards applied by the law to insanity in different contexts. The divorce court, for instance, is nowadays much concerned with questions of "incurable unsoundness of mind" under the Herbert Act. Is the standard of insanity here the same as that of the famous rule in McNaghten's case which the judges apply in criminal prosecutions? Last year, in Astle *v.* Astle, Mr. Justice Henn Collins seemed to answer the question in the affirmative. He was reluctant to establish in the divorce court a measure of legal responsibility not applied to any other court. The facts of the case, it may be recalled, were these. The husband made murderous assaults upon his wife and other persons in May, 1927; he was certified insane in June and was detained in an asylum. Coming out on parole, he told his wife he meant to kill her and commit suicide. In the following October he was discharged, but his wife was too frightened to live with him. In 1931, being now at liberty, he visited his wife and uttered violent threats. Six years later he was again certified and placed under restraint. The wife petitioned for divorce on the ground of his cruelty. The judge held that the acts in the first period were not cruelty because the husband was insane and therefore was incapable of being knowingly and wilfully cruel. His insanity at this period, said Mr. Justice Henn Collins, was insanity within the rules in McNaghten's case; the man was labouring under such a disease of the mind as not to know the nature and quality of the acts he committed. The judge found himself able, however, to accept as sufficient evidence of cruelty the incident of the threat, uttered at the visit to the wife during the supposedly sane period in 1931. A recent article in a legal contemporary (*Law Times*, June 8) doubts whether the judge was right to apply to divorce proceedings so stiff a test as the McNaghten standard. A suit for divorce is not a criminal prosecution.

In this connexion there was an interesting decision in a county court last year where the victims of a traffic accident sued in respect of the negligence of a taxi-cab driver. The defence was that the taxi-cab driver was insane and therefore not responsible. Judge Konstam held that the driver understood the nature and consequence of his act in causing the cab to swerve, that he knew he was driving a motor-vehicle and that, in swerving, he would be endangering his own and other vehicles. Findings such as these would mean that the driver was certainly not insane within the rules in McNaghten's case. The county court judge nevertheless decided that the driver was insane enough to be relieved from liability for civil negligence.

This diversity of legal standards is inconvenient. It is a pity that the criminal courts cannot see their way to modify the McNaghten test laid down nearly a hundred years ago. However conservative the judges may be in the administration of criminal justice, medical opinion cannot help reflecting the progress made by our ideas of mental disease since 1843.

Guilty of Criminal Abortion

Severe sentences were passed at the Central Criminal Court last week upon two men found guilty of conspiring together to perform illegal operations

on three women. One of the accused, Crichton Alison, M.B., Ch.B. Aberd., a medical practitioner described as a specialist in anæsthetics, had a consulting-room in Harley Street and a panel practice in Lambeth. The other was an oriental medical student named Kermani, living at West End Lane, Hampstead. The prosecution alleged that the procedure was similar in the case of all three women. They called at Harley Street and were sent by Alison to Kermani, who used instruments with intent to procure miscarriage. The fees charged were said to have been £50, £50 and £65 respectively. Alison gave evidence that he received 3 guineas as his consultation fee in each case; he thought Kermani was a doctor; all three women, he said, had been interfered with before they came to consult him. Kermani said he never pretended to be a doctor; he denied using an instrument; he only examined the women and gave them treatment for threatened abortions which had been caused before they came to him; he received only £20 for each patient. Mr. G. B. McClure, who prosecuted, said that Alison used the respectability of his Harley Street address to carry on a criminal practice with Kermani. Sentence of five years' penal servitude was passed upon both the accused. A woman living at the same address as Kermani, also found guilty of the charge of conspiracy, was bound over.

On the second day of the trial prosecuting counsel informed the court that two men had approached the foreman of the jury and asked him how much it would be worth to him to "make the case go the other way." Acting on the instructions of the police, the juryman accepted £50 in £10 notes which the men offered him. On this statement Mr. Justice Atkinson caused a new jury to be sworn and the case was started afresh with the result already mentioned. Two men were subsequently charged at the police-court with conspiring together and with other persons to prevent the due course of justice, and were remanded in custody.

IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

FOR some months our hospital had been in commission, treating casual sick and injured among the forces at home, and becoming, as we hoped, thoroughly seasoned in the process. From time to time there were rumours of impending convoys from overseas, and on several occasions we carried out minor evacuations to enable us to take them; but always something miscarried and our patients were snatched away from us. Then, late one evening, there came the story that a train was standing by to bring overseas casualties to our hospital—a convincing touch that made us feel that something really was about to happen—and the morrow was largely dedicated to putting finishing touches to preparations long elaborated and well-rehearsed. Members of staff away from the hospital were recalled, the adequacy of ambulance personnel at the station duly verified, voluntary stretcher-bearers warned for duty within the hospital, the local sergeant of police asked to hold in readiness his plans for patrolling crossings between station and hospital, and thought given to as many as possible of the hundred and one little things that in the aggregate mean so much to the reception of a large number of patients. Which members of the staff should be sent off duty to rest now? Should we not give the stretcher-bearers a meal before they began work? Had we plenty of cigarettes for the incoming patients? How could we best redistribute existing patients? Hundreds of questions like these hurried the day away, and in the evening we received official information that our train would arrive at 1 A.M., that it carried 200 casualties, of which about a third were British and the remainder Allies, and that about 40 were stretcher cases. This news created something of a stir. But the tension was fortunately relieved by the mixed nature of our bag. French was hurriedly polished, linguists were in demand and distributed throughout the departments; everywhere there was a feeling that the events of the morning were not to be without their lighter side. This anticipation was amply justified. The make-up of our first convoy could scarcely have been better: it was searching enough to test our arrangements yet not heavy enough to be really burdensome, either in medical need or psychological upset.

* * *

The machine was put in motion. The staff, permanent and coöpted, was fed and sent to battle stations, and after a last quick look round we hied ourselves to the station to meet our train. Just on time it crawled in, and we greeted the train officer, extracting from him his passenger list. He reported that he had nothing in need of immediate surgical attention, and we left him with our colleague in charge of detraining to send up first all the sitting cases and then the stretcher patients. We had some fourteen ambulances, most of them capable of taking four sitting patients, so that it soon became apparent that the hospital would be hard put to it to keep pace with the numbers arriving at the reception room. In practice it was found necessary to suspend dispatches from the train for fifteen minutes during the detraining of the sitting patients and for a similar period before beginning to unload stretcher cases.

In the reception room itself the scene was an animated one. The Allies proved to be a heterogeneous crowd—predominantly French, but with smaller contingents from Belgium and Poland. The faces—and the tongues—made a striking contrast. At the entrance door each patient had enough particulars taken to identify him later and was relieved of his equipment, such as it was. In the reception room he was rapidly examined by a member of the staff and his condition compared with his medical record. Then it was decided on the results of examination and traffic conditions within the hospital to which ward he should be admitted. The selected ward was marked on his forehead by grease pencil and relays of porters took him to it. All the patients were in bed within two and a half hours of the arrival of the train, so that the work of distribution was intensive while it lasted. That did not mean that it was without its lighter moments. Some of the patients regarded their branding with profound distrust; one Frenchman was overheard to ask another what it was all about, and the reply was sinister enough—"Abattoir!" Hasty explanations per suaded the victim that our intentions were honourable. There were many minor difficulties. Allies who would insist on being together, though their medical conditions did not lie that way in any well-conducted hospital, and Allies who would persist that they were officers, though we had been informed that there were none such on our train: they went into our officers' ward, discretion being the better part of valour.

Amid the bustle and apparent confusion of the reception room the prevailing impression of these tired and rather haggard men was one of cheerfulness; only one was noticeably dour, and he, appropriately enough, was a Scot from Banff. The same Scot preserved for some time his rather pagan outlook. He took unkindly to a suggestion that he should have an enema. "Ach, Sister," he said, "dinna kirn aboot wi' ma bools; it's no natural, the Picts and Scots didna dae it." But even he relented. Enemata were distinctly unpopular. A Frenchman, whose bowels had refused to function for six days, when

ordered one had to be chased all over the building before he could be got to bed. Indeed, it was difficult to persuade many of our patients to go to bed at all—they seemed to think that it was so near 4 A.M. that it was not worth while doing so, though why they thought 4 A.M. was rising time in our hospital was beyond our comprehension. These Allies seemed to desire nothing better than to parade our corridors in almost complete undress, and it was no unusual sight to see a fluttering sister trying to guide her charges back to bed to the tune of Couche ! Couche ! rather like a scandalised hen shepherding her chicks, I am afraid.

* * *

Perhaps the most striking feature about the clinical condition of the patients was the great improvement brought about by a day or two under hospital conditions. Soon they were thirsting for fresh adventure and meeting it in all sorts of places, not all of them orthodox. It was not unusual to find a nimble Frenchman skipping blithely through our shrubbery, pursued by one of our lumbering custodians of law and order ; he in turn pursued by our hound, Bobby, barking furiously. In the main the patients are a happy, contented lot, not difficult to handle. Our Allies had only one complaint to make of our cuisine, and that a curious one—they wanted more bread, thickly cut. Their entertainment presented no great difficulty, for they were quite pleased to sit in the sun and talk the hours away. They liked croquet, and bowls seemed to intrigue them. Concerts and entertainments—garden fêtes and the like—there were in plenty, and one highlight was a visit to the local cinema to see in a news reel the sinking of a vessel from which some of our patients had been rescued : as one of them exclaimed excitedly, "I saw me." One man applied for a pass to visit a neighbouring village, giving as his reason that he needed new boots, and when it was pointed out to him that these would be provided from our pack store the true nature of the main disability emerged : " I do not the water drink," he said.

News of the arrival of our convoy spread rapidly and brought the usual swarm of locusts, visitors of all hues greatly interested in our colourful Allies—"Aren't they pets ! " The visitors included a bevy of press photographers who snapped many strange sights, most of them fortunately suppressed by a benevolent censor. Most of our patients were willing enough to be photographed, and the few whose modesty or sense of decorum restrained them found their misgivings melting away when they saw that the nurses, too, were being photographed. Our final impression is that the reception of a convoy is as nothing to the disposal of it.

* * *

Many stories are told with the general theme of " What does A. do now ? " Matron vouches for the truth of this one, for it happened to a friend of hers. This friend had two engagements one afternoon—a somewhat formal attendance at a funeral, and a more genial encounter at a tea-party. She put on a sober black hat, intending to change it after the funeral for her new " this season's flowery creation," which she carefully laid on the back seat of her Austin Seven. She drove to the cemetery, parked her car in the general line, and made her way to the little chapel. At the graveside, like many people, she could not forbear when it was all over to look around at the wreaths and their inscriptions. Suddenly she saw her own new hat among them ; one of the undertaker's men had seen it left behind in the car, and had tried to be helpful.

I read your Peripatetic's appreciation of the stallion's prowess to my friend the V.D. officer. " Yes," he said thoughtfully, " last week at the clinic I saw a Norwegian sailor with gonorrhœa. He had been knocking about our seaport for three weeks, and I asked him the usual questions about when he had last exposed himself to the risk of infection. The man found considerable difficulty in deciding, for nineteen out of the twenty-one nights had been spent in different but still accommodating arms. If THE LANCET had a ' silly season ' one might be inclined to ask ' Is this a record ? ' "

Public Health

From the School Reports

FROM his report for 1939 to the education committee we learn that Dr. J. V. A. Simpson, M.O.H. of *Torquay*, was appointed chief billeting officer under the evacuation scheme. Admitting the obvious advantages of this arrangement, for in small boroughs the M.O.H. has in his head and his desk full information of the billeting facilities of his district, most medical officers are thankful that the work of billeting was not added to the numerous honours thrust upon them. Before the war the number of names on the elementary-school register of Torquay was 4076 ; at the end of December 1939 the number was 4521. The boys' grammar school at Torquay received 410 pupils from St. Olave's School, Uckfield, Sussex. Moreover, at the end of August 110 children on holiday were " left behind " and billeted as unaccompanied children, and 800, which subsequently shrank to 400, unofficial evacuees drifted into the elementary schools. The added children produced no special health problems, but Dr. Simpson calls attention to the interest and importance of studying the effects of evacuation on those evacuated.

Taunton is another reception town. Dr. John Allen in his school report gives the number of evacuees received as 420 official and 160 unofficial. The average number on the roll of elementary-school children in 1939 was 2994, so the added children were well diluted. They do not appear to have given any special difficulty. A scheme for free immunisation against diphtheria of all children aged 1–8 years was introduced at Taunton in December 1938, but so far the response has been poor, for only 296 children had been protected by the end of 1939. Taunton has no blind or deaf children as defined by the Education Act 1921. In 1939 there was no head ringworm and only 3 cases of body ringworm, but 44 cases of scabies.

Exeter, which unlike Torquay and Taunton is a county borough, is another reception area for which the annual school report for 1939 was published early. Dr. G. F. B. Page in this report gives separate tables for the defects treated of native children, official evacuees (about 780) and refugees (about 930). Amongst the natives there were 9 head and 12 body ringworms and 45 scabies. Amongst the foreigners there was no ringworm but 8 scabies.

Infectious Disease in England and Wales

DURING THE WEEK ENDED JUNE 1, 1940

Notifications.—The following cases of infectious disease were notified during the week : smallpox, 0 ; scarlet fever, 1079 ; whooping-cough, 633 ; diphtheria, 766 ; enteric fever, 39 ; measles (excluding rubella), 7842 ; pneumonia (primary or influenzal), 644 ; puerperal pyrexia, 162 ; cerebrospinal fever, 275 ; poliomyelitis, 4 ; polio-encephalitis, 0 ; encephalitis lethargica, 2 ; dysentery, 36 ; ophthalmia neonatorum, 105. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on May 31 was 709, made up of : scarlet fever, 142 ; diphtheria, 131 ; measles, 23 ; whooping-cough, 22 ; enteritis, 63 ; chicken-pox, 21 ; erysipelas, 26 ; mumps, 7 ; poliomyelitis, 1 ; dysentery, 3 ; cerebrospinal fever, 63 ; puerperal sepsis, 28 ; enteric fevers, 6 ; german measles, 30 ; other diseases (non-infectious), 55 ; not yet diagnosed, 88.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from scarlet fever, 3 (1) from enteric fever, 2 (0) from whooping-cough, 4 (0) from measles, 13 (0) from diphtheria, 31 (0) from diarrhœa and enteritis under 2 years, and 19 (2) from influenza. The figures in parentheses are those for London itself.

Newcastle-on-Tyne and Bristol reported the second and third fatal cases of enteric fever. There were 3 deaths from diphtheria at Plymouth. Birmingham reported 10 deaths from diarrhœa.

PARLIAMENT

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE new situation created by the declaration of war by Italy led to the postponement of the secret session fixed for Tuesday in last week, because the Prime Minister and all the service ministers were so occupied outside the House that they had not time to attend and take part in a debate. But, as at present arranged, the session is to be held on Thursday of this week, and except for any official statement which may be issued that is all that the public will hear. Despite all statements to the contrary the previous secret session—on which certain persons pretended to have inside knowledge—was in fact really secret. I was there and I know. Thursday's session, if held, and all arrangements now are liable to sudden alteration without notice except by the wireless, will be equally secret. The subject will be Home Defence.

As Mr. Churchill was too occupied to attend Parliament on Tuesday of last week, Mr. Attlee, Lord Privy Seal, made a statement dealing not only with the Italian declaration of war, but with the withdrawal of our forces from Norway—after rendering Narvik unusable. So rapidly has the perspective of war changed that this withdrawal attracted little comment. It is accepted on all hands that the war is an all-Europe war. The Italian decision to come in has extended the war not only to the Mediterranean Sea but to north and central Africa. In his broadcast to the French nation on June 13 M. Reynaud appealed for greater aid from President Roosevelt, and spoke of France in certain circumstances continuing the war in north Africa or even in the French American possessions. The war is in an explicit and literal sense becoming a war which touches all continents and in which all the world's populations and resources are likely to be involved.

Members of the House of Commons are having to readjust their views of the war situation rapidly and at short intervals, but even under the stress of the new major development the comment on Italy was very different from the comment on Germany. In Mr. Attlee's statement Italy came third on the list of subjects, the first being the withdrawal from Norway and the second the naval losses following on that withdrawal. The Italian attack we were told "does not cause us dismay," and it was one for which we were prepared. Many members in private expressed sympathy for the Italian people led against their will into war.

In one sense the declaration of war by Italy simplifies the situation. The chief difficulties about economic blockade arose in the case of Holland, Belgium and Italy, because it was through them that supplies went into Germany. Now these entries for supply are stopped. The problem now is more that of pre-emption—"buying up under the nose of Germany," as the Minister of Economic Warfare put it the other day—in those countries still open to trading with our enemy. But what the Italian intervention will bring about in the military sense has at the moment of writing still to be demonstrated.

* * *

Leaving the general consideration of the war and its conduct on the European field of battle the House considered some useful measures. The Colonial Development Bill went through its committee and third-reading stages on Tuesday of last week, and the Labour Under-Secretary proved himself as unyielding about accepting amendments as his predecessor had been, but as reassuring as to the Government's good intentions. Colonial development in war-time must clearly be limited to matters closely connected with the war effort or resulting immediately in an increase of productive capacity, as, for example, improvement of African agriculture. But it is unfortunate that neither the Colonial Advisory Committee nor the Colonial Research Committee is to be appointed at present.

There was a great deal of criticism of the Government's refusal to appoint these committees, reference to which is specifically made in the memorandum to the bill only recently introduced by Mr. Malcolm MacDonald. The excuse that men of the required capacity cannot be found or should not be employed on such duties at the present time is not a good one. It is well known that there are many men of great experience in colonial affairs who are not fully employed and who could give time to consider the long term programmes of development which are essential in the colonies. But the bill will very soon be on the statute book and we all hope it will not be stillborn.

Another useful bill passed was that for giving the local authorities in London powers to remit rates in the cases of hardship caused by war conditions. These powers have been in the possession of local authorities in the provinces for a long period, but the London rating authorities have had no option but to demand payment or inflict punishment. The many war sufferers, including boarding-house and hotel proprietors or lessees, will now be able to get relief and to claim retrospective relief if a court order against them has not already been made.

* * *

The B.B.C. and Mr. Val Gielgud, as director of features and drama, came in for scathing criticism in connexion with the dramatisation of the battle of Narvik and there has been a good deal of uneasiness about the position of men of military age employed by the B.B.C. But Mr. Duff Cooper, who is such an excellent broadcaster himself, and with a sense of news which has been very reassuring on several occasions, put up a good defence.

* * *

Other debates last week, one on civil defence and one on evacuation, brought interesting statements from Sir John Anderson, the Minister of Home Security, and Mr. MacDonald, now the Minister of Health. But on neither day could debate be very free because these subjects are so intimately bound up with home defence on its military side. One medical member wished to know whether the problems of civil defence had been re-surveyed in the light of our most recent knowledge of methods of German attack by the parachutist and the troop-carrying plane—new methods which affect not only A.R.P. precautions of the local civil defence type but also the policy of evacuation.

Because of the rapidly changing face of war our policy on all these matters, as on questions of hospitals and medical matters generally, needs continual re-survey. We fight on the home front now as well as overseas, and that insistent problem of standards of nutrition of the population keeps putting up its head.

* * *

One day last week the Parliamentary Secretary to the Ministry of Food made a statement on milk prices and the supply of cheap milk which will certainly be implemented to the extent of an increase of 4*d.* a gallon on the price of milk from July. Will it be implemented as regards the supply of cheap milk, at 2*d.* a pint, to children below school age, expectant and nursing mothers and persons unable to afford the normal market rate? It must be stated quite simply that the obstacle in the way of this being done is dissatisfaction by the milk distributors at the margin of profit they are allowed to charge for distribution. Their opposition has prevented the cheap milk scheme working as it ought to have worked for a long period. Reassuring ministerial statements have been made before in the House of Commons but the milk has not arrived. The responsibility for this state of things is a grave one in time of war and the question of cutting out costs of distribution by establishing milk depôts where customers can call for milk and get

it at a cheap rate is being considered. But if something is not done effectively very soon the Ministry will have to consider nationalisation of the milk-supply, which would take it out of the distributors' hands.

FROM THE PRESS GALLERY

Civil Defence

In reviewing the Government's plans for civil defence Sir JOHN ANDERSON, Home Secretary, said in the House of Commons on June 12 that the issue of equipment was now for practical purposes complete, with reserves. They had issued 60,000,000 respirators of all kinds, 3,000,000 steel helmets, 1,500,000 oilskin suits, more than a hundred thousand stirrup pumps, and 350,000,000 sand-bags. He had declined to cut down civil-defence personnel with undue haste but as a result of a review a revised establishment had been issued which should prove adequate. The total A.R.P. establishment, paid and unpaid, was to be nearly 1,000,000, of which 180,000 were whole-time and paid. So far as whole-time personnel was concerned the Government might have to make use of their compulsory powers. The total number of persons for whom shelter had been provided by local authorities and employers was 20,000,000. The Government did not set out to provide shelter for all. They were going to concentrate on the crowded and most vulnerable areas and they expected those in a position to do so to provide domestic shelters for themselves. We had now to reckon not merely with the risk of bombing attack, but with the new menace of invasion. In the arrangements necessary to provide the fullest possible protection against these new threats the regional organisation established under the A.R.P. scheme would prove invaluable.

Evacuation and Hospital Services

Mr. MALCOLM MACDONALD, Minister of Health, in opening a debate in the House of Commons on June 13, first referred to evacuation and said that the Government had decided against compulsion except possibly in the comparatively small areas where it might be necessary for military reasons. If the Government had compelled evacuation and some evacuees had been killed, they would have assumed heavy responsibilities. Turning to the hospital services, Mr. MacDonald said that the great system evolved by the Ministry of Health to look after both civilian and military casualties was now receiving its first real test. In the last fortnight they had received from Dunkirk and other parts of the front several thousand military casualties which had been distributed over more than 50 hospitals in different parts of the country. In general the arrangements had worked satisfactorily, in spite of some inevitable hitches and mistakes. Mr. Colville, who until recently had been Secretary of State for Scotland, accompanied by Mr. Rock Carling, adviser to the Ministry of Health on casualty services, and Mr. Bearn, principal supply officer to the Ministry, had gone to visit the various regions to watch the hospital system at work. The terms of reference of this commission were unlimited.

Sir FRANCIS FREMANTLE said that in 1938–39, when they had to decide whether to expand the military hospitals as in the last war, and similarly to expand the civil hospitals for casualties which they could not estimate in advance, the Government were right in deciding to have a system based on the civil authorities under the local authorities. The only exceptions were a few military hospitals and one or two of the standing hospitals of the Royal Navy and the Royal Air Force. But there were certain definite disadvantages about this arrangement which had come out in the last six or seven months. Since a considerable number of military patients came into the hospitals they had to have a military registrar and a great deal of military discipline. That had introduced a difficult division of authority. Representations had been made that it would be a great advantage if the senior medical staff of these hospitals were given definite military rank, status and uniform so that they might be recognised. Apart from this division of authority, complications had been introduced into our hospital system which tended to create difficulty and delay. Patients back from the front had not had the advantage of up-to-date treatment, and their convalescence had therefore been delayed. By up-to-date methods he meant physical massage, surgical manipulation, electric treatment of joints, short-wave diathermy, active convalescence and occupational therapy. Equipment had been lacking in many hospitals, and the difficulty arose not so much from the lack of provision by the Ministry of Health as from the fact that they had offered services and payments to local hospitals which had not been able to accept the offers and start a department for this kind of treatment. He wished to know why many specialists engaged in this work in hospitals all over the country were not being employed.

Sir ERNEST GRAHAM-LITTLE said that the conduct of the emergency medical services in London had been perhaps the most criticised of the measures carried out by the Ministry of Health in the last nine months. The unprecedented step of taking over the staffs and personnel of the London voluntary hospitals for full-time service under the jurisdiction of the Ministry of Health immediately destroyed the whole system of hospital practice, and created an exceedingly dangerous position with regard to the treatment of the civilian population. As late as last April in St. Bartholomew's Hospital out of 780 beds only 145 were being used for civilians. The scheme was based on the fallacious conception that the best treatment for war casualties could be found not in London but on the periphery ten or twenty miles out. Dr. Trueta, the Spanish surgeon, had made the point that anything but immediate attention on the site to air-raid injuries was useless. It had been found that immediate attention was required unless 40 or 50 per cent. of the casualties were to be fatal. At a hospital inspected by Sir E. Graham-Little, instead of the skilled personnel to receive the casualties advised by Dr. Trueta, the doctors who would sort out casualties consisted of three junior medical officers of the status of a registrar, none of whom had any surgical experience. The idea of transporting wounded persons was all wrong and he hoped it would be abandoned. The question of first-aid posts should be reviewed, and precautions taken to see that no casualty was regarded as trivial until it had been pronounced upon by experienced workers.

Captain ELLISTON said he found general agreement that the emergency medical scheme had achieved a reasonable measure of success, and this was because the Minister had wisely coöperated closely with the British Medical Association. He asked the Minister for an assurance that medical personnel were being used to the best advantage. Physio-medical treatment of war injuries had largely developed since the last war, and it was very desirable that it should be available for both military and industrial casualties.

Miss HORSBRUGH, parliamentary secretary to the Ministry of Health, replying to the debate, paid a high tribute to the work done in the hospitals during the recent disembarkation from Dunkirk. An officer of the French medical service had asked her to thank the Government and the people of this country for the way in which the French and Allied wounded had been received and looked after. An advisory committee had been set up on the subject of physiotherapy. It must be remembered, she said, that first-aid posts for air-raid casualties were liable to be bombed, and it might not be possible to get transport to them. They must be able to set up first-aid posts at other places. Surgical personnel and equipment must be mobile. It would be a disaster if they had too many expert surgeons in places where in time of an air-raid it might be impossible for them to reach casualties. They had succeeded in staffing up to full capacity all the hospitals which were receiving casualties.

QUESTION TIME

Unsafe Milk

Mr. DAVID ADAMS asked the Minister of Health whether he was aware that tubercle bacilli and other pathogenic organisms found in untreated, non-designated milk rendered it unsafe for human consumption; and what remedial measures he proposed.—Mr. MALCOLM MACDONALD replied: I am aware of the problems presented by the liability of milk to infection, and, recognising the value of pasteurisation as a protection against such risks, I am considering what action I can take to secure the best results from its use. The hon. member will appreciate the practical difficulties, particularly those of securing further pasteurising plant, involved in present circumstances, but I can assure him that, when conditions permit, I should not hesitate to seek any powers that might be necessary and capable of general application to secure the adequate protection of the public health.

Mr. DAVID ADAMS asked the Parliamentary Secretary to the Ministry of Food the quantity of non-designated milk supplied by the Milk Marketing Board as food during the last 12 months, and the approximate quantity of the same pasteurised before being marketed to the public.—Mr. BOOTHBY replied: While I feel that it is not in the national interest to give information relating to milk production in this country, I may tell my hon. friend that 45 per cent. of the milk produced during the last twelve months was designated milk. The amount of milk which is pasteurised varies very extensively from town to town and detailed figures are not available.

Rural Sanitary Services

Sir GIFFORD FOX asked the Minister of Health whether, in view of the increased pressure on accommodation in rural districts, he would instruct all medical officers of health to watch carefully the question of the provision of adequate sanitary arrangements, especially since those existing are only intended for the use and accommodation of the population in peace-time.—Mr. MACDONALD replied: Local authorities have already been asked to bear these matters in mind in connexion with their billeting arrangements.

Danger of Water Pollution

Sir IRVING ALBERY asked the Minister if he had considered the reports submitted by the Gravesend and Milton Water Works Company, showing the danger of pollution to the water supply arising out of sewerage disposal of the military camp at Northumberland Bottom; and, in view of the urgency of this matter, what action was being taken.—Mr. MACDONALD replied: I have had under consideration the representations made by the company. Representatives of the War Office and of the company are about to confer as to the action required, and I have arranged for my officers to take part in the discussion.

Badges for Blood Donors

Mr. SUTCLIFFE asked the Minister whether he would consider the issue of a badge which could be worn by all blood donors at the present time, to indicate this form of public service.—Mr. MACDONALD: I fully recognise the value of the public service rendered by blood donors but I do not consider that the issue of a badge is required in this case. There are many forms of national service for which badges are not issued.

Special Diets for Invalids

Mr. G. GRIFFITHS asked the Parliamentary Secretary to the Ministry of Food whether the food rationing (special diets) advisory committee of the Medical Research Council had given any further advice on the effect of rationing in special invalid cases.—Mr. R. BOOTHBY replied: The committee have recommended extra sugar rations should be allowed to those suffering from spontaneous hypoglycæmia and extra meat rations in exchange for the butter ration to those suffering from steatorrhœa (cœliac disease and tropical sprue). The necessary arrangements will be made as soon as possible.

Colonial Research

Mr. M. P. PRICE asked the Under-Secretary of State for the Colonies when it was proposed to set up the colonial research advisory committee; how it was proposed to recruit its members; and what were to be its precise powers and functions.—Mr. G. HALL replied: The Minister is unable to say how soon circumstances will permit of the committee being set up. As has already been announced, Lord Hailey has consented to serve as chairman of the committee. No other appointments to it have yet been made. The general functions of the committee have been described in the paper already laid before Parliament and there is nothing that I could usefully add at this stage.

Visits to Soldiers in Hospital

Mr. DAGGAR asked the Secretary of State for War if he would state the amount of financial assistance given to wives and other members of the family who desired to visit soldiers who had been wounded in the war.—Mr. EDEN replied: Free travelling is admissible for two persons to visit a soldier who is dangerously ill in the United Kingdom, the Channel Islands, the Isle of Man, Eire or France. Visits to France have necessarily been discontinued in present circumstances, but will be resumed when conditions permit. If the wounded soldier is not dangerously ill, half-fare concessions are available for visits in this country by his wife and children under 16 years of age if he is married, or by his parents, brothers and sisters if he is unmarried. The British Red Cross Society have been good enough to provide guides and accommodation free of charge for relatives who visit France, and are considering the provision of similar facilities at home.

An Unsubstantiated Claim

Mr. KEELING asked the Home Secretary whether he had seen the advertisements appealing specially to women, of Benin products, claiming that they were a protection against mustard and other liquid gases if applied beforehand and an antidote if applied after contamination and that leading authorities were agreed as to their vital importance; and whether these products had been examined with a view to prohibiting advertisements making false claims.—Sir JOHN ANDERSON replied: Yes, Sir, and the matter has already been receiving the careful attention of my department. A sample of the cream mentioned in the advertisement has been tested by my expert advisers, and it was found that the claims made for it could not be substantiated. The claims made in the advertisement are unwarranted, and, in fact, tests show that this product is not so good as bleach paste for treating the human skin after contamination with liquid mustard gas. I am considering what is the best method of keeping a check on the publication of advertisements making claims in respect of A.R.P. devices or methods of treatment.

The Lancet 100 Years Ago

June 20, 1840, *p.* 459.

From a leading article.

THE presence of Father MATHEW among the drunken population of London should be preceded by that of Friend AQUA PURA, that the reformed people may at least have clean water to fall back upon, when the gin-puncheon is struck from beneath their feet. To exchange beer and spirits for the undisguisedly filthy liquor which the Water Companies squirt into our glasses and tea-pots, is unlikely with those who reflect—though few entertain the thought—that the untinctured beverage is saturated with living animals and dead mud,—"water" (says Mr. GLAZIER) "that comes from the Thames, wherein all the privies, water closets, and drains from all the houses go. That," he adds, "cannot be such water as the people of London ought to drink, and do drink, again and again."

The second addendum to the British Pharmacopœia, 1932, was published on June 14, 1940, and became official on that date.

OBITUARY

ROBERT FORTESCUE FOX

M.D. LOND., F.R.C.P., F.R.MET.S.

Dr. Fortescue Fox, who died in London last Saturday in his 82nd year, will be remembered as a physician who was not content with partial recovery for his patients. He could not bear that soldiers should leave hospital with stiffened limbs or joints, and he was the guiding spirit in founding the Enham colony to prevent this. He could not bear to see rheumatic people crippled or in pain when persistent care might renew their efficiency and comfort, and again he was the leading spirit in starting the Red Cross clinic in Peto Place, London. To achieve this purpose, he had profound belief in the efficacy of natural agents, using them at first empirically and later working out by controlled observation the basis of their action. And he was something of a medical fundamentalist, inheriting from an unbroken line of Quaker doctors of six generations, not only his medical outlook, but a tenacity of purpose and independence of thought which left a trail of fruitful endeavour for others to carry on. All his six brothers were doctors and two of his six children entered the medical profession. Dr. Iris Fox died in 1926 of a post-mortem infection after having made her mark as a pathologist at the Royal Free. Dr. T. F. Fox joined the staff of THE LANCET in 1925 and is now on active service.

Youngest of the seven sons of Joseph John Fox, surgeon, of Stoke Newington, and Sarah Angell Allen, R. F. Fox was born in 1858 and brought up in a scholarly home, where the boys helped with their father's surgery and learnt their mathematics and Latin from him in his leisure hours. Like all his brothers, he entered on a medical career; and, despite myopia, delicate health and reticent manner, was an exceptionally successful student at the London Hospital. After qualifying with a university gold medal he was house physician to Sir Andrew Clark, but developed signs of tuberculosis and was dispatched as ship's surgeon on a voyage to China. About this time Clark was asked to find a doctor for Strathpeffer Spa in Rossshire, and little knowing to what it would lead Fox accepted the nomination and set off to seek his fortune in the far north. The choice proved happy, for he gained in strength and saw Strathpeffer develop from a village with a few crofters to a climatic station with 10,000 patients every summer among whom his evident ability, and his genuine care for his patients, brought him a large practice. He stayed in the Highlands twenty-five years; but latterly he spent the winters in studying foreign spas, bringing back the idea of the peat bath, and began to work in London as a general physician. In 1905 he left Scotland and returned to his own city, where he went on working to the end of his life. He had married a daughter of the Rev. W. S. McDougall.

During the last war, Dr. Fox continually and successfully insisted on the value of physical treatment, including various kinds of baths and massage, for minimising the effects of war injuries. Working at the Alexandra Clinic for officers, and later at Shepherd's Bush, he modified the *eau courante* bath of French physicians to the "whirlpool" now widely used, and he helped to introduce the sedative pool to British medicine. This experience was summarised in his "Physical Remedies for Disabled Soldiers," and later in the more comprehensive "Principles and Practice of Medical Hydrology"; he also wrote "Causation and Treatment of Chronic Rheumatism" jointly with Dr. van Breemen of Amsterdam. From therapeutic methods he was led on to consider the fuller restoration of function, and he saw more clearly than others that treatment ought to be associated with training—that is to say, with re-education for work and for life. This association was the intended basis of the village centres movement, which planned to restore the efficiency of ex-soldiers and later meet the needs of industry for more efficient convalescence after accidents. At the end of the last war, in which he lost one of his sons, Fox gave all his thoughts and energy to realising this policy, and a start was made with Enham Village Centre near Andover, of which for a year he was whole-time medical director.

The development of British spas, and specialisation in their function, was another of his abiding interests. For very many years he edited the health resorts' section of the "Medical Directory," and he continued the editorship when this was expanded into the handbook of the British Health Resorts Association, which he had helped to found. Latterly he was impressed by the need to put "the seaside" on a more scientific basis by collecting accurate data about the action of wind, weather and water on the children exposed to them in hundreds of thousands every year. Unfortunately the present war has interfered with the programme of his new Committee for Research on Delicate Children at the Seaside, just as it has interfered with the two international organisations for which he was largely responsible—the International Society of Medical Hydrology and the *Ligue internationale contre le rhumatisme*. To these various public movements, and particularly to the *Archives of Medical Hydrology*, which he long edited, he gave a devotion which other men reserve for business or sport. He could write vividly and succinctly, and though committee work and appeals wearied him almost intolerably, he never spared himself so long as he felt he could do something to forward an important principle or a useful end.

Few men have tried harder to break down the national barriers that hinder the mission of medicine, and though he was little of a linguist, Fox won the affectionate respect of colleagues in the many countries —from the U.S.S.R. to Portugal—where the international society which he had founded held its annual meetings. When recently some of these colleagues turned into refugees he did his utmost to mitigate their sufferings, spending sleepless nights on the problem of finding them work or a harbour. Further afield, he associated himself with the work in Syria of the Lebanon Hospital for Mental Diseases, of which, like his brother, the late Dr. Hingston Fox, he was long the London chairman.

He was perhaps a better judge of ideas than of men; but his readiness to believe the best of them was part of the sympathy that made him good at treatment. Having this sympathy, he took trouble over

the details that make the difference between comfort and discomfort and sometimes between life and death, and he shifted his patients' burdens on to his own shoulders. Diagnosis, he might have said, is not enough; and he was interested in disease because it attacks people—not in people because they are attacked by disease. Hence came his preoccupation with the social aspects of medicine—the restoration of the convalescent to health, the mitigation of chronic disabilities like rheumatism to which little attention was paid because it seldom causes death. But anyone who concerns himself with social movements is doomed to many disappointments, and Fox had the uncomfortable mental life of the idealist who is always coming up against—not so much hard facts as hard-headed men and women who have no use for general principles and no faith in a better world. In eighty years he had acquired much wisdom and much skill in compromise; but the old man was still unable to avert all the knocks that came to the carroty-haired sanguine boy who still lived inside him. He was never quite a man of the world, and he would have neutralised his usefulness if he had been content to become one. Too often he felt the loneliness of the prophet whose words are unheeded or misunderstood, and it was fortunate for him that until his last few years he had wide interests outside medicine—in archæology, poetry and travel. Even in his 82nd year he was happily still a gardener, and happily still retained his farmhouse garden on the Sussex coast.

His poems were published anonymously under the title "Time and the Timeless."

ALFRED RICHARD DENIS PATTISON

M.B. DURH., F.R.C.S.

A. R. D. Pattison was the pioneer of neurological surgery in north-eastern England: his untimely death on June 7, at the age of thirty-seven, is a disaster to the district. He was also taking an increasingly prominent place in the rather small company of British neurological surgeons, and can ill be spared from their ranks, especially in war-time. He had recently completed the organisation of a centre for head injuries at an E.M.S. hospital, and was distressed that illness prevented him from tackling the work when the convoys arrived. He leaves a wife and young son.

Pattison was educated at Clifton House School, Durham School and Durham University. At the university he was awarded the Gibb Scholarship in pathology and the Rutherford Morison Travelling Scholarship in surgery. He qualified M.B. in 1929. A visit to Berlin followed and he was appointed in turn medical officer and surgical registrar at the Royal Victoria Infirmary in Newcastle. In 1931 he obtained his F.R.C.S. Pattison was among the last of Harvey Cushing's pupils at the Peter Bent Brigham Hospital, where he spent a year as surgical assistant. He was a faithful though not slavish follower of his master: the example of Cushing was seen in his meticulous records, duly illustrated by drawings and photographs, and in his careful pathological investigations of every specimen. He took a special interest in the diagnosis and treatment of intracranial aneurysms; and in 1937 in his Hunterian lecture on pituitary basophilism and again in our own columns he recorded his success in treating some cases by implantation of radon in the gland.

After these wanderjahre the wisdom and foresight of the Newcastle municipal authorities enabled him to establish a neurosurgical department at the Newcastle General Hospital, and this was the main centre of his activities, though he carried on similar work at the Sunderland Municipal Hospital. The work of these clinics had developed on a large scale, and practically all operations on brain tumours and allied conditions were placed in his hands by transfer of patients from the other hospitals of the area. He sacrificed all other work, which would have been much more lucrative, to devote himself to his chosen specialty.

F. J. N. writes: Pattison was undoubtedly a man of brilliant intellect. He had a remarkable memory: his recollection of patients, and the details of their cases though seen long before, often astonished his friends. He read widely in several languages. In recent years his work was interrupted by devastating attacks of asthma, but he was never discouraged and in spite of delicate health he carried through prolonged and exhausting operations with supreme skill and a high measure of success. It was often pathetic and always inspiring to see his determination and courage in such difficult circumstances. He travelled widely to neurosurgical centres and owed special allegiance to Olivecrona in Stockholm and Jefferson in Manchester.

THOMAS GEORGE DOUGHTY BONAR

M.D., M.S. LOND., F.R.C.S.E.

Mr. Bonar died suddenly on June 7 at the age of 44. He qualified from Guy's Hospital in 1919 and after holding a number of house-appointments was surgical registrar and obstetrical registrar and tutor there. He was an able teacher and gained a considerable reputation for getting borderline cases past the examiners. He had a singularly tidy mind, though he cared little for tidiness of person, and he could hold the student's attention without effort. He just missed being appointed to the honorary staff at Guy's but was able to continue the teaching side of his work at the London School of Clinical Medicine, where he was subdean. His association with the Seamen's Hospital at Greenwich, with which the school is linked, began in 1928, when he was appointed assistant surgeon. In the same year he was promoted to surgeon with charge of outpatients, and he held the two positions until his death. He also played his part in the administration of the hospital, and in the non-medical activities of the Seamen's Hospital Society. For some years he had been surgeon to the Evelina Hospital for Children. His technical skill and versatility were of a high order, and he never spared himself even when a recurring duodenal ulcer made caution essential. He had lately spent a heavy week working with casualties from the B.E.F., and it is likely that this precipitated his death.

LADY TATA MEMORIAL GRANTS.—The trustees of the Lady Tata memorial fund will, if circumstances permit, make the following awards for research in blood diseases with special reference to leukæmia, in the academic year beginning on Oct. 1, 1940:

Grants for research expenses: Dr. M. P. J. Guérin (Paris); Prof. Karl Jármai (Budapest); Prof. E. L. Opie and Dr. Jacob Furth (New York); and Dr. A. H. T. Robb-Smith (Oxford).

Part-time personal grant and grant for research expenses: Dr. Werner Jacobson (Cambridge).

LETTERS TO THE EDITOR

A.R.P.: WHERE THE G.P. COMES IN

SIR,—In these very anxious times your leading article on general practitioners and air-raid precautions is very interesting. I would like to point out that the Halifax A.R.P. casualty services scheme (set up on the outbreak of war) provides for the attendance of certain general practitioners (not otherwise engaged at first-aid posts or hospitals) at the scenes of air-raid disasters. Such a provision is not officially recognised, nevertheless we decided to put it into operation. The advantages of having doctors at the scenes of disaster are too obvious to need cataloguing.

I am, Sir, yours faithfully,

GEORGE C. F. ROE,
Medical Officer of Health, Halifax.

SIR,—Your leader is timely. The G.P.s in each ward of a city or town should be correlated to the casualty service. Each should be provided with an armlet marked C.M.O. (civil medical officer) and a card of authority signed by the M.O.H. to show any M.O. of a unit and the incident officer. The M.O. of a mobile unit, though not possessing legal authority to commandeer a house, could no doubt in most cases get one. It appears necessary to have more such powers by either M.O. of a mobile unit or the incident officer. If more mobile units were taken up from the outset it would have saved a lot of money in altering schools for aid posts and would have been cheaper in staff requirements. These posts are, like "fixed" aid posts, equipped with Thomas splints, but the Government's policy is to direct first-aiders only to tie one limb to another in fractures of the lower limb. As the mortality from fractured thigh has been reduced from 70 to 25 per cent. by the aid of a Thomas splint, and it only takes five minutes to put this fracture in a previously prepared Thomas splint, it seems desirable that the Government's teaching (through its surgical adviser) should be ignored.

I am, Sir, yours faithfully,

A.R.P., M.O.

X-RAY FLYING SQUADS

SIR,—Dr. Graham Hodgson has rightly called attention to the economy of mobile X-ray sets which he states cost but a fraction of the cost of modern standard units. He further states that the latter are not required in 80 per cent. of war casualties. I would go further and say that the modern 30 M.A. portable ward unit is eminently satisfactory in 100 per cent. With such a unit, housed in a room of a large unfurnished hospital, without even a chair or table, I recently demonstrated its efficiency in dealing with a large convoy. Many of the patients were radiographed lying on brown paper spread over the rough builder's floor, others more seriously injured on the trolleys. Even with these crude facilities the work was so expeditiously and efficiently performed that a steady flow of cases passed to the theatre and the loss of the surgeon's time was reduced to the minimum.

The procedure adopted was as follows. The wounded men were examined by the surgeons who decided which needed immediate attention. These men were sent to the theatre via the X-ray department. Here the wounds were inspected by the radiologist and such radiographs taken as were deemed essential to show the position and extent of fractures and the presence of foreign bodies. Any of the latter which showed evidence of anaerobic infection (and they formed a large percentage), or where it was thought the surgeon would wish to extract the foreign body, were accurately localised with the patient placed in the most favourable position for operation (rough localisation in the aggregate wastes the surgeon's time). The wet films with my full report of these features were then passed on to the theatre. Over 200 films per day were turned out in this manner by our team of 4 (one engaged in recording, &c., one in developing, one in arranging patients, &c., and the radiologist).

This I believe to be the constitution of the ideal X-ray flying squad which, with a mobile 30 M.A. unit, could rapidly be brought to meet all the requirements of the emergency service of any large hospital. In this emergency work the radiologist must himself see all the patients, direct the radiography, and report on the films immediately. Under these conditions the services of trained radiographers are not essential, for within an hour or so the radiologist can direct any intelligent workers to perform the accessory duties quite efficiently.

With the possibility of damage to electric supply it is to be regretted that the cheaper portable units such as were supplied to us by the War Office in 1914–18 have not been made available. They would have given excellent service and better radiography at a still less cost than the present mobile units.

I am, Sir, yours faithfully,

Edgbaston, Birmingham. JAMES F. BRAILSFORD.

SIR,—There seems to be a prevalent idea that the manufacturing resources of the British X-ray industry will be insufficient for war requirements. In actual fact the various firms manufacturing X-ray apparatus in this country are not so fully occupied and in some cases have actually been able to accept orders for other work of national importance. The only difficulty has arisen from the fact that there have been delays in some instances in placing orders until the apparatus is urgently required. We can say quite definitely that the manufacturing capacity for X-ray equipment in Great Britain is abundantly equal to all demands made upon it for war requirements.

We are, Sir, yours faithfully,

WATSON AND SONS, LTD.,
SCHALL AND SON, LTD.,
London. NEWTON AND WRIGHT, LTD.

THE LATENT PERIOD IN CARCINOGENESIS

SIR,—In your annotation on June 8 (p. 1054) you state that "from none of the descriptions of late results of tarring or painting of pure substances has there emerged any peculiarity either local or general of cell or tissue response in the latent period." Perhaps the observations made by myself on mice treated with various carcinogenic hydrocarbons (*J. Path. Bact.* 1938, **46**, 495) have escaped your notice.

It was shown that while the early squamous hyperplasia of the epidermis is not specific for carcinogens characteristic changes develop later in the deeper tissues. Of these, the first to be found is an alteration in the texture of the superficial part of the dermis, fine-fibred, non-refractile collagen replacing the normal coarser refractile fibres. This change, which is associated with passive congestion of the subcutis and followed by alteration in the texture of the elastic

tissue, gradually extends to involve the whole thickness of the dermis. With the more potent carcinogens —e.g., methylcholanthrene—the change is present throughout the treated zone of skin; with weak carcinogens it may be focal in distribution, and it is of interest that in such cases the early tumours are related to foci of altered dermis. In many cases two further changes are found beneath young tumours, namely, fibrosis of the subcutis and defects in the elastic tissue of the dermis.

The experiments were controlled by observations on mice treated with non-carcinogenic chemically-related hydrocarbons, and with various non-carcinogenic skin irritants, and in the few cases where such agents produce changes resembling the characteristic "precancerous" process there was evidence of inflammation in the form of considerable leucocytic infiltration of the tissues, which is not a feature of the carcinogenic reaction.

At the time when the paper cited was written systematic observations had been made with six carcinogenic hydrocarbons. Since then further carcinogens have been studied, and it appears that the more rapidly a given hydrocarbon produces these changes the more potent is its carcinogenicity. It therefore seems justifiable to suppose that they are of specific importance in relation to carcinogenesis.

I am, Sir, yours faithfully,

School of Medicine, Leeds. JOHN W. ORR.

SULPHATHIAZOLE

SIR,—Dr. W. R. Thrower states in his letter of May 18 that sulphathiazole "was first prepared in the research laboratories of Messrs. May & Baker early in 1938." I do not know whether this sentence should be interpreted as a claim to priority of preparation, but in fact sulphathiazole was prepared independently, and possibly at an earlier date, in the laboratories of the Society of Chemical Industry in Basle (Ciba), Switzerland. A detailed description of the manufacture of sulphathiazoles was filed with the Swiss patent office on Sept. 16, 1938, and patents have already been granted to the society in France, Palestine and Belgium. Early in 1940 the compound was placed on the market in Switzerland under the trade name Ciba 3714.

Although American reports have drawn particular attention to the use of sulphathiazole in staphylococcal infections, preliminary clinical investigations in this country tend to confirm Gsell's[1] conclusions that Ciba 3714 is also superior to sulphapyridine in possessing an equally satisfactory action against pneumococcal, gonococcal, and meningococcal infections, while causing fewer side actions and above all little or no gastric disturbance.

The relatively low concentration of sulphathiazole sometimes found in body fluids, to which reference is made in your leading article of May 11, was also mentioned by a speaker at the Royal Society of Medicine this week. Oesterheld,[2] of the Ciba laboratories, refers in a recent paper to the unexpected difficulties which have occurred in the estimation of sulphathiazole by Marshall's method, particularly in urine, and indicates possible sources of error which may result in values that are much too low. He gives in detail a new and simple colorimetric method which has been found in Switzerland to give accurate results.

I am, Sir, yours faithfully,

Ciba Laboratories, Horsham. N. HOWARD JONES.

1. Gsell, O. *Schweiz. med. Wschr.* 1940, **70**, 342.
2. Oesterheld, G. *Ibid.* p. 459.

TREATMENT OF CEREBROSPINAL FEVER

SIR,—Dr. Lloyd Hughes and Dr. Harwood are interested in my reasons for suggesting that sulphapyridine as against sulphanilamide is the drug of first choice in the treatment of meningococcal disease. They are based upon: (1) experimental work with meningococcal infections in mice; (2) personal experience with each of those drugs used singly and also in combination in cases of cerebrospinal fever. Experimental evidence is admittedly neither extensive nor strikingly in favour of sulphapyridine, although it distinctly tends in that direction. Protocols published by Whitby (*Lancet*, 1938, **2**, 1095) indicate for sulphapyridine a slightly greater activity against meningococci, and by Maegraith (*Brit. med. J.* 1938, **2**, 985) a slightly more successful inhibition of growth of meningococci, as compared with sulphanilamide. The experiments of Powell and Chen (*J. Pharmacol.* 1939, **67**, 79) also suggested the same slight superiority of sulphapyridine, although the difference in potency of the two drugs was not considered by the authors sufficient to be significant.

My personal experience of a difference in effectiveness of these drugs is mainly derived from the early period of chemotherapy when sulphanilamide was being tried in meningococcal meningitis in various dosages. I then learned that a low initial dosage of sulphanilamide might fail to save patients who, according to all subsequent experience, would most probably have recovered on larger doses. Since then, I have always been careful in using sulphanilamide to employ the high daily dosage of 3 grammes in infants graded to 9 g. in adults during the initial period of two to three days. On the other hand, although I have usually employed the same dosage for sulphapyridine, there have been quite a number of cases in which much smaller doses of this drug were given without any apparent diminution of the usual rapidly curative effect. Sulphapyridine is therefore the drug of first choice because with it a greater latitude of dosage appears to be permissible, and this constitutes, in the varying circumstances of practice, an important factor of safety.

The importance of the dosage interval has, of course, been generally recognised since Marshall's early work on absorption and excretion of the drug. The four-hourly interval is employed in the first three days, and thereafter four- to six-hourly intervals according to convenience.

May I add that in the rapid evolution of the chemotherapy of this disease a further change is already foreshadowed. Experimental evidence shows that sulphathiazole (M. & B. 760 or Ciba 3714) is at least as potent in meningococcal infections as sulphapyridine. Clinical evidence is so far limited, but 7 cases, including 5 children, have been treated with success in Switzerland. I have used the new drug in 16 cases of meningococcal meningitis, usually but not always after two or three preliminary doses of sulphapyridine, and have been impressed with the rapid improvement in the clinical condition and the very rapid clearing of the c.s.f. The great advantage of this drug is the relative absence of nausea, vomiting and depression, and there is also practically no cyanosis. The cases on which it has been used so far have been only moderately severe, but the sodium solution is available for intravenous injection in severe acute cases. If further experience confirms these early findings sulphathiazole may yet become the drug of choice in cerebrospinal fever.

I am, Sir, yours faithfully,

H. STANLEY BANKS.

Park Hospital, Hither Green, S.E.13.

A CALL FOR HELP

SIR,—The Ladies' Guild of the Royal Medical Benevolent Fund beg to place before your readers the need for help in money, clothing and personal service in their work of assisting widows and children who are beneficiaries of the fund. There are large numbers of those who through age and infirmity require regular money grants; to them our failure would mean destitution. Many subsisting on meagre incomes require gifts of coal, clothing and invalid comforts—all beyond their own resources. There are widows left suddenly with families in the critical stages of education; if we can help them the family may become self-supporting, otherwise they are overwhelmed and sink into extreme poverty.

We are facing these difficult times with an excess of expenditure over income and with the prospect of reduced revenue and increased responsibilities, but if every woman connected with the profession would subscribe to the guild (the minimum subscription is 2*s.* 6*d.*) all demands could be met. Subscriptions should be sent to the hon. treasurer, Ladies' Guild of the R.M.B.F., Tavistock House (North), Tavistock Square, London, W.C.1. I am, Sir, yours faithfully,

LAETITIA N. HUTCHISON.

SOLDIER'S DOCTOR

SIR,—Like many others of my age I gave the best years of my life to being a soldier's doctor and loved the job. Who can forget those battalions in which commanding officers and adjutants came and went while doctor and quartermaster stayed on and on? We knew the officers and we knew the men. We saw the drafts arrive. We developed an uncanny skill in picking out at first sight the good from the bad: the new colonel with a big-game hunting reputation who would wangle a staff job within a few weeks, the quiet city clerk who would stick it to the end. No need to worry about a professional reputation or the quarterly panel cheque, we had only to keep the men fit and if they were sick or wounded to restore them as quickly as possible to their work. We saw men go down the line with simple flesh wounds, some to return within a few weeks, others to be lost for months in base hospitals or convalescent homes. Some of us worked in these base hospitals and out of it came the realisation that soldiers need proper soldiers' doctors. If a driver suffers a motor accident he will the more quickly regain his nerve if he drives again the next day. So it is with the soldiers. After the accidents of war one kind of hospital treatment will make him, another kind will mar him.

I raise this question to ask if the men now going into the R.A.M.C. are receiving the instruction and advice which will help them in their jobs, and also to ask if the E.M.S. civilian hospitals to which the wounded are now being sent are places in which their morale will be maintained or places in which their fears and weaknesses will be fostered in spite of themselves. Yesterday I saw a grocer's assistant who was shot in the forearm at the age of 18 in 1916. His battalion had not yet been in heavy action, so his medical officer supported his own wish that he should not go down the line. He carried on. Next year he was wounded through the lung at Bourlon Wood. There followed hæmoptysis and pleural infection which was treated in a hospital at Abbeville. Then two months in a hospital in England before going back to be in time for the March retreat. He was back to duty within four months of being wounded. That was good army doctoring. That man would now be sent to a civilian hospital and stay there under the care of a chest surgeon, but would he thus receive the quick encouragement to be back with his battalion?

The hospitalisation of soldiers is one of the most technical of medical problems. Mere skill in investigation and diagnosis is not sufficient. Ill chosen electrocardiography may breed D.A.H., and orthopædic specialists may foster hysterical palsies. I believe that specialists of this kind should never be in charge of soldiers' wards and that soldiers should be in proper soldiers' hospitals. Let the E.M.S. look after the hopelessly wounded soldiers, but the remainder should have the advantage of discipline and other kinds of skill.

I am, Sir, yours faithfully,

PERTINAX.

Medical Diary

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

WEDNESDAY

Surgery—5.30 P.M., Mr. Kenneth Walker: Protection of the Soldier in Warfare. Lord Horder, Sir Charles Gordon-Watson, and Sir Harold Gillies will also speak.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

TUESDAY.—2.30 P.M., Sir Walter Langdon-Brown: ward clinic.

WEDNESDAY.—11.30 A.M., clinico-pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Carbohydrate Metabolism and Diabetes. 3 P.M., clinico-pathological conference (surgical).

THURSDAY.—2 P.M., Dr. Duncan White: radiological conference.

FRIDAY.—2 P.M., clinico-pathological conference (gynæcological). 2.30 P.M., Mr. V. B. Green-Armytage: sterility clinic.

DAILY.—10 A.M.–4 P.M., medical clinics; surgical clinics and operations; obstetrical and gynæcological clinics and operations. 1.30–2 P.M., post-mortem demonstration.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

Brompton Hospital, S.W.3, TUES. and THURS., 6 P.M., M.R.C.P. course in chest diseases.

Births, Marriages and Deaths

BIRTHS

BEVAN.—On June 15, at Shrewsbury, the wife of Captain Edward Bevan, R.A.M.C., of Cambridge—a son.

BULMAN.—On June 9, at Cambridge, the wife of Lieutenant J. F. H. Bulman, R.A.M.C.—a daughter.

GOLDBY.—On June 12, in Adelaide, S. Australia, the wife of Dr. Frank Goldby—a son.

LAMB.—On June 12, at Weymouth, the wife of Surgeon Lieutenant F. H. Lamb, R.N.—a son.

SALAMAN.—On June 11, at Harpenden, the wife of Dr. Myer Head Salaman—a son.

SALKELD.—On June 14, at Bournemouth, the wife of Mr. Roy Salkeld, F.R.C.S.E.—a son.

MARRIAGES

BLAIR—LAMMOND.—On June 15, at Palmers Green, Robert Alexander Blair, M.B., to Olive Mabel Lammond.

DARKE—WILD.—On June 12, in London, Christopher Sydney Darke, M.D., M.R.C.P., to Margaret Annie Crossley Wild.

DEATHS

BIRD.—On June 13, at Basingstoke, Gerald Francis Bird, M.C., M.B. Camb., of Godalming, aged 61.

FOX.—On June 15, in London, Robert Fortescue Fox, M.D. Lond., F.R.C.P., F.R.Met.S.

MARSH.—On June 16, at Huntingdon, Jane Marsh, M.D. Brux., L.R.C.P.E.

NORRIS.—On June 8, at Hillingdon, Middlesex, William Perrin Norris, M.D. Melb., D.P.H., aged 73.

O'KINEALY.—On June 6, at Torquay, Frederick O'Kinealy, C.I.E., C.V.O., M.R.C.S., Lieut.-Colonel, I.M.S.

PRICE.—On June 10, at Plymouth, Francis Edward Price, F.R.C.S.E., aged 66.

STREPTOCIDE—In view of the demand for sulphanilamide for the treatment of bacterial infections of wounds, Evans Sons, Lescher and Webb Ltd. (Liverpool) are now issuing this drug in 15 g. packets.

MEDICAL NEWS

Royal College of Surgeons of England

AT a meeting of the council held on June 13 with Mr. Hugh Lett, the president, in the chair, it was decided to hold an additional final fellowship examination in February. Prof. G. Grey Turner was re-appointed as the representative of the college on the council of King's College, University of Durham.

It was reported that the Sir Gilbert Blane medal for 1940 had been awarded to Surgeon Lieut.-Commander P. K. Fraser, R.N., for his original work on superficial ringworm infections.

Diplomas of fellowship were granted to the following:

H. L. M. Roualle, C. H. Bliss, H. F. Anderson, T. McM. Boyle, Oswald Lloyd, W. D. Park, A. W. Bone, C. H. Tanner, G. P. Arden, J. C. Newbold, Kathleen M. Robinson, A. S. Aldis, P. M. Kelly, E. M. Evans, A. D. Le Vay, P. J. Mullaferoze, W. B. Waterfall, E. G. Dolton, Nicholas Vere-Hodge, M. H. Harmer, J. I. P. James, A. G. McPherson, N. J. Dhondy, V. K. Desai, G. G. Cooley, Hussein Abd-El-Aziz, Peter Berbrayer, Rex Blunden, A. K. Dutta Gupta, M. H. El Zeneiny, R. M. Fawzi, W. R. Gayton, Albert Gild, J. M. J. Jens, P. J. Kenny, D. H. Mackay, A. M. Minaisy, M. S. K. Rudd, M. L. A. Samie, K. C. Sarbadhikari, H. K. Sett, A. H. M. Sharkawi, B. K. Sheorey, John Swinney.

A licence in dental surgery was granted to K. R. Titford (Guy's Hospital), and diplomas in anæsthetics were granted, jointly with the Royal College of Physicians, to the following:

J. B. Bamford, Katharine Banks, J. F. J. Bereen, D. J. A. Brown, K. C. Brown, Samuel Carden, P. C. Conran, J. R. Dunn, R. A. Gordon, K. C. Grigor, F. R. Gusterson, W. E. Hadden, S. R. T. Headley, Elliott Isaacson, Mary K. W. Langston, J. D. Laycock, J. A. Lee, Samuel Mark, P. J. W. Mills, W. W. Mushin, E. A. Pask, L. M. Shorvon, M. R. W. Spacek, W. N. Taylor, K. B. Thornton, Joan Watts, and H. D. Wyse.

It was decided to recognise the posts of resident surgical officer and first and second house-surgeons at Ancoats Hospital, Manchester, for the six months' surgical practice required of candidates for the final fellowship examination.

The following examiners were elected for the ensuing year:

Dental Surgery—Surgical section: Mr. E. G. Slesinger, Mr. Reginald Vick, Mr. J. Basil Hume, Mr. L. E. C. Norbury, Mr. A. C. MacLeod, and Mr. A. J. Gardham.

Primary Fellowship—Anatomy: Mr. E. P. Stibbe, Prof. F. Wood Jones, Mr. A. M. A. Moore, Surgeon Rear-Admiral G. Gordon-Taylor. Physiology: Prof. D. T. Harris, Prof. A. St. G. J. Huggett, Prof. H. P. Gilding, and Prof. R. J. S. McDowall.

Diploma of L.R.C.P., M.R.C.S.—Elementary biology: Mr. A. E. Ellis, Mr. S. R. B. Pask, Mr. Wilfrid Rushton, D.Sc., and Dr. E. I. Jones. Anatomy: Prof. W. J. Hamilton, Prof. A. B. Appleton, and Mr. James Whillis. Physiology: Prof. D. T. Harris, and Prof. Hamilton Hartridge, F.R.S. Midwifery: Mr. J. St. G. Wilson, Mr. Leslie Williams, Mr. G. F. Gibberd, and Mr. Harold Taylor. Pathology: Prof. W. G. Barnard, Mr. D. H. Patey, Prof. W. D. Newcomb, and Mr. R. M. Handfield-Jones.

Diploma in Public Health—Part I: Prof. John Eyre. Part II: Dr. Charles Porter.

Diploma in Tropical Medicine and Hygiene—Dr. Hamilton Fairley, and Dr. Philip Manson-Bahr.

Diploma in Ophthalmic Medicine and Surgery—Part I: Mr. Affleck Greeves, and Mr. Frank Law. Part II: Mr. Adrian Caddy.

Diploma in Psychological Medicine—Surgeon-Captain Macdonald Critchley.

Diploma in Laryngology and Otology.—Part I: Mr. N. A. Jory, and Mr. Terence Cawthorne. Part II: Mr. Edward Carew-Shaw.

Diploma in Medical Radiology—Part I: Dr. H. T. Flint. Part II: Mr. G. F. Stebbing.

Diploma in Anæsthetics—Dr. A. S. Daly.

Diploma in Child Health—Dr. Alan Moncrieff, and Dr. Charles Harris.

Orthopædic Clinics in Scotland

Lord Craigmyle, addressing the Cripples' Welfare Association, said that Scotland lagged behind in her preparations for the treatment and welfare of cripples, particularly adults. They lacked the organisation and equipment for turning a crippled man who was a burden to himself and the community into a self-respecting and self-supporting citizen. If they could establish in every county an adult cripples' clinic with a group of doctors and others with orthopaedic training, they would receive official backing. He announced an anonymous gift of £500, the sole condition being that at least £100 should be allocated to the adult orthopaedic clinic which it was proposed to start in the Borders.

University of Cambridge

Dr. G. W. Harris and Dr. L. H. Aitken have been appointed demonstrators in anatomy for one year from Oct. 1.

Mr. Malcolm Donaldson has been appointed examiner in midwifery for part I of the Final M.B. examination this month instead of Mr. A. J. McNair, who is unable to act.

At recent examinations the following were successful:

FINAL EXAMINATION FOR M.B. DEGREE

Part I: Surgery, Midwifery and Gynæcology.—H. J. Anderson, O. B. Appleyard, W. D. Arthur, L. J. Bendit, R. G. Benians, A. P. Bentall, P. T. Boyle, B. N. Brooke, H. T. Calvert, H. D. L. Campion, R. L. Canney, O. Clarke, R. Crawford, P. J. Crowley, G. E. H. Enderby, G. G. France, R. Friedman, P. Haden, J. S. Hesketh, E. V. Hope, E. W. Hyde, D. M. Jackson, F. S. Jackson, T. E. Jones-Davies, R. K. I. Kennedy, D. Laing, J. J. Landon, J. M. Lipscomb, A. G. G. Long, I. B. Mackay, D. H. Manson-Bahr, P. F. Milling, H. V. Morgan, M. C. Mundle, W. H. Parkinson, J. F. Paxton, A. D. Payne, P. E. Perceval, F. T. G. Prunty, A. H. Rea, L. Read, S. R. Reynolds, R. D. S. Rhys-Lewis, T. W. Rowntree, R. A. Shooter, L. W. Smith, C. S. N. Swan, L. R. S. Taylor, R. M. Todd, D. N. White, C. F. H. Wiessner, J. M. Wilcox, T. N. P. Wilton, C. H. Wood, F. J. Y. Wood, D. G. Wraith, N. G. Clegg, J. Gibbon Davies, P. G. Holman, E. Rhodes, and R. M. Stevenson.

General Medical Council

At a meeting of the executive committee of the council on May 27 it was reported that the following names had been restored to the Medical Register after non-penal removal:

Richard E. Grandy, Francis H. McKenna, William A. Malone, Henry J. Mathews, Isaac M. Sclare, Herbert J. Sheppard, William M. C. Smith, Andrew Thornton, Ruby E. Winning, James W. Wylie, and William L. Yell.

Irish Medical Union

At the annual meeting of the union held on June 6, Dr. Patrick MacCarvill, the outgoing president, in the chair, resolutions were carried offering the government the complete co-operation of the union in organising a national medical service to meet the present emergency, with the proviso that the union does not revoke any of its previous decisions. For some months the union has followed a policy of non-coöperation with the government because of their persistent neglect to remedy various grievances which the union had put forward. These claims are to be held in suspense.

Dr. D. F. MacCaisley, who was elected president of the union, has been vice-president for the last two years. He is a medical officer of the dispensary service at Crookstown, co. Cork, and a lecturer in therapeutics in University College, Cork. Dr. John P. Shanley, who was honorary secretary of the union for ten years after its establishment, has been elected vice-president.

Before the business meeting a scientific session was held, at which Dr. J. C. Flood gave an address on minor surgery in general practice. Dr. P. J. Keogh spoke on the same subject from the point of view of a throat surgeon, and was followed by Dr. P. A. M. FitzGerald. In the evening a very pleasant dinner was held at the Shelbourne Hotel, where some seventy members and guests sat down to table.

Appointments

CAMPBELL, CHARLES F., M.B., D.P.H., assistant tuberculosis officer and assistant resident medical officer at Rushden House Sanatorium, Northampton.

LA CROIX, J., M.D. Manitoba, surgical first assistant at the Royal Infirmary and Hospital, Sheffield.

O'CONNOR, MARGARET M., M.R.C.S., D.P.H., temporary assistant medical officer of health for Heston and Isleworth.

SPRINGFORD, W., M.B., surgical first assistant at the Royal Infirmary and Hospital, Sheffield.

TIBBLES, SYDNEY, L.R.C.P.E., hon. eye surgeon to the British War Refugees' Fund.

Examining Surgeon under the Factories Act 1937: Dr. W. E. F. DAVIDSON (Battle, Sussex).

NOTES, COMMENTS AND ABSTRACTS

BIRTH TRAUMA AMONG PRIMITIVE PEOPLES

By C. A. H. Watts, M.B. Durh., D.R.C.O.G.
SENIOR MEDICAL OFFICER, ETALANENI MISSION HOSPITAL, ZULULAND

Badly neglected cases of labour have almost entirely disappeared from obstetrical practice in England, where doctors are to be found in almost every village and transport to the nearest hospital is swift and easy. The position in rural Africa is very different. There doctors are rare beings and transport is always difficult if not impossible. As a student I often wondered what would happen to the persistent occipito-posterior if there was nobody to rotate the head and deliver the fœtus with forceps. My curiosity has been amply satisfied here in Africa. The cases of severe birth trauma here described show how nature is often capable of dealing with the situation in a way which was a surprise to me.

CASE-RECORDS

Case 1.—I had to drive eight miles on a rough track in my car and ride for an hour and a half on horseback to reach this patient. She was an unmarried Zulu girl of about eighteen. This was her first pregnancy and she had been in labour for a week. Her condition was shocking. She was quite exhausted and her face was cold and clammy. There was no pulse at her wrist, and her temperature was subnormal. The abdomen was grossly distended with tympanitic bowel, and tender. There were no fœtal heart-sounds. The vulva was covered with foul-smelling sloughs, and the scalp of the fœtus was distending the remnants of the labia. A little gentle traction on the scalp produced a stinking macerated fœtus together with the placenta and a large volume of foul urine. The whole birth canal appeared to be in the process of sloughing. Disproportion had apparently been overcome by collapse of the fœtal skull. There was no bleeding. It was difficult to define the pelvic organs, but it was clear that the urethra and posterior bladder wall had sloughed. As a placebo I left a supply of sulphanilamide tablets, and I gave the worst possible prognosis. Three months later the patient and her father turned up at the hospital outpatient department. The girl's general condition was good. Her complaints were pelvic pain and complete incontinence of urine. Her uterus was still palpable, and there was a tender swelling extending from it into the left iliac fossa. The vagina was much stenosed, and it was painful and difficult to introduce a single finger. The whole of the vulva and vagina was clothed with skin or mucous membrane, and I could not locate the vesicovaginal fistula, although urine could be seen coming out of the vaginal orifice. I felt that surgical intervention at this stage would be premature and in any case beyond my powers, so I dismissed the girl with a large bottle of a citrate mixture. Six months after her delivery she turned up again. She assured me the medicine had been most effective for after a fortnight the urinary incontinence had cleared up completely! She now wanted something to ease the persistent pelvic pain. The uterus was still enlarged and tender. The vaginal stenosis had progressed, and now even a finger could not be inserted. There had been no return of menstruation.

Case 2.—This patient was admitted to hospital when she had been in labour for at least seven days. Her pulse although feeble was only 76, and the temperature was normal. She looked very toxic and ill. Her abdomen was distended with resonant bowel. The scalp was showing at the vulva, and there was a fearful smell of putrefaction. Under light anæsthesia an attempt was made to apply forceps, but the vagina was sloughing and did not allow the blades to be inserted. A firm grasp was taken of the scalp itself, and a good pull effected a delivery. The placenta followed immediately and there was no bleeding. The fœtus was macerated and stinking, and the whole vagina appeared to be sloughing. An examination five days later showed a complete absence of urethra and posterior bladder wall. The pubic bone lay bare and fæces were oozing into the vagina. Day after day large foul sloughs were reported to have come away. To everyone's surprise and distress the patient survived. She was sent home after 7½ weeks. She still had complete incontinence of urine, but fæces no longer appeared in the vagina. The pubic bone was bare, and large areas were still covered with granulations, but the discharge of sloughs had ceased. There was as yet no evidence of vaginal stenosis. During her convalescence she had two weeks of sulphanilamide treatment, and her temperature, while irregular, never rose above 101° F. and the maximum pulse-rate was 114.

Two points of interest arise from these cases. If the patient is strong enough to survive the ordeal of a seven-day labour she has had time to mobilise all her forces against infection, which is localised in the pelvis. Thus the prognosis is not as hopeless as it appears to be. In both cases I forecast an early death, and I was wrong. Secondly, when the birth trauma is extensive fibrosis is also extreme in the later stages. The shrinking of this cicatricial tissue is capable of healing a fistula, which it would have been most difficult to tackle by surgical methods. As a student I was led to believe that a vesicovaginal fistula never healed spontaneously, and that operative cure was difficult and not always crowned with success. Fairbairn in his textbook explains that the bladder fistulæ seen in England are nearly always due to instrumentation, and he points out that such an injury is not followed by the intense fibrosis which follows pressure necrosis. Thus the fistula which occurs in England will not tend to heal in the way it did in case 1, where shrinking of the fibrous tissue was clearly nature's method of effecting a cure.

Case 3.—This was a Zulu woman who was some 32 weeks on in her seventh pregnancy. On doing the routine pelvic examination I found she had an old complete tear of the perineum dating from her first labour, which had been difficult. To my surprise the patient said she had no trouble with her bowels, except after a purgative.

Case 4.—This was a Zulu woman of about 34 who was pregnant for the third time. The first labour had ended with a live child, after a difficult labour. She must have then had a complete tear of the perineum, because afterwards she suffered from fæcal incontinence. A second pregnancy quickly followed the first, ending in an easy birth. The incontinence of fæces continued for some months after this, but control gradually returned. When seen by me the patient appeared to have no anal sphincter, the vaginal orifice and anus appearing as one opening. An inch or so inside this cloaca a thin transverse septum divided the rectum from the upper reaches of the vagina. The patient claimed to have perfect control of the bowels, except after a dose of opening medicine.

It seems then that, given time, nature can produce some sort of neuromuscular control over the lower bowel, even when anatomically the continuity of both internal and external sphincters appears to have been destroyed.

Case 5.—A Zulu woman of about 30, who gave a history of a difficult first labour, producing a stillborn child. She fell pregnant again and was successfully delivered by cæsarean section. This was six years before her consultation with me. Her general condition was good. Her pelvis was small, with an external conjugate of only 6¼ in. Fibrosis of the vagina made it impossible to measure the diameter of the diagonal conjugate. The vagina contained a constricting ring of fibrous tissue, which would only admit two fingers. The fœtus was in the right occipito-anterior position, and the head was freely movable above the brim. Was the cæsarean section performed for the small pelvis, or for the fibrosis?

I decided to wait and see what happened. The patient was allowed to come into labour, and the head soon slipped into the pelvis. An hour later it was on the perineum. The stricture did not appear to be an insuperable obstacle, and I thought it might be relieved by multiple incisions. I carried this out and applied forceps through the ring without difficulty. However, it became evident on the first pull that the stricture would not allow the head to pass. It is tantalising to see the fœtal head apparently all ready for an easy lift out and to realise that abdominal section is the only method of delivery. A cæsarean section was performed. Being an inexperienced surgeon I had to go through the upper uterine segment. However, good fortune was with me and the patient was discharged from the hospital with her baby three weeks later. Needless to say her convalescence was not entirely afebrile, but her temperature never rose above 100·4° F. and there were never any alarming symptoms.

Fibrosis is a friend when it causes a troublesome fistula to close up, but if the woman becomes pregnant again she presents a difficult obstetrical problem. The textbook says that a cæsarean section is essential in cases where there is undilatable atresia of the cervix and vagina. That sounds clear enough; but to one inexperienced in the strength of fibrosis it is difficult to assess the dilatability of a stricture.

CASE 6.—A Zulu woman aged about 30. She had a difficult first labour ending in a stillbirth. She then had two miscarriages, one at five months and the other at three months. Four years ago she had a difficult premature labour, producing a live 3 lb. baby which survived. She came to me about eight months on in pregnancy. She said she had had severe pelvic pain, and this was followed in the night by a slight hæmorrhage which had eased the pain. Abdominal examination showed the baby to be in the L.O.A. position, and the head was freely movable above the brim. Her external measurements were satisfactory, and beyond great tenderness little could be made out by the vagina. The blood-pressure was normal and there were no signs of toxæmia. I advised her to come at once to the hospital 15 miles away but no Zulu unless at death's door will consent to do that before the family have been consulted. She arrived at the hospital a week later in great pain, referred to the hypogastrium. The urine was normal and there was nothing abnormal on abdominal examination. No uterine contractions were felt. She was admitted for observation. That night bleeding started again, and once more the pain eased off. The next morning she was examined under anæsthesia. The vaginal vault was composed of hard fibrous tissue, and with difficulty a tiny pin-hole os was found in the region which should have been the right fornix. Of cervix there was none. The vagina itself was short, and the walls were thickened. The bleeding was slight, and I was unable to confirm or exclude a placenta prævia. I felt a cæsarean section on an eight-month fœtus was not justified; and I considered that if bleeding did occur it could easily be controlled through such a minute os. I was not left in doubt for long. The next day she came into labour; the head was soon deep in the pelvis, and there was no more bleeding. Four hours later the membranes ruptured. The vaginal examination which followed was very difficult, as the whole vagina appeared to be extremely tender. However, I could feel that the head was low and I could get one finger into the os. Three hours later the patient, who had been having good pains, was beginning to show signs of exhaustion. The fœtal heart was difficult to hear behind a loud souffle. A further vaginal examination showed no change in the os. A cæsarean section was therefore performed and an asphyxiated 3¼ lb. fœtus was produced. It was resuscitated but died twelve hours later.

My explanation of this case is as follows. At her first labour the cervix probably sloughed off completely. She then suffered from incontinence of fæces for two further pregnancies. The increasing fibrosis permitted the fœtus to survive eight months in the fourth pregnancy, but the delivery was difficult. In the fifth pregnancy the fibrosis amounted to an undilatable atresia. When the so-called "painless" contractions of the uterus occurred towards the end of pregnancy they stretched the fibrous tissue in the region of the os and caused considerable pain. When the stretched part gave, as evidenced by antepartum bleeding, the pain disappeared.

MORAL

From these cases I have learned to have a great respect for fibrous tissue. If this is a result of serious birth trauma in the past a cæsarean section will probably be necessary. Intense vaginal tenderness which makes a thorough pelvic examination almost impossible without an anæsthetic is a symptom of such fibrosis.

These cases will remind practitioners in England of the bad old days. I offer my apologies to the expert accoucheur for the times when I fell short of the obstetrical ideal. It is not a good thing to do a cæsarean section after applying forceps, and one takes a risk in doing a pelvic examination on a case of antepartum hæmorrhage of unknown origin, but the medical Jack-of-all-trades who is isolated from the experts has to take risks.

MAKE-BELIEVE

TRAINING in first-aid may be very dull, especially for the trainer, but Capt. A. C. White (First-aid Competitions. Dale Reynolds. 1*s.*) has tried, in a short pamphlet to show how some of this boredom can be eliminated. At first glance his competitions seem to be formal and inelastic, but there may be room even for formal and inelastic training. No competition will ever be anything like as tough as the job that has to be done in real life. The object of competitions and of training must therefore be to develop team-work; bearing in mind that a team that is a snip to win a competition may come out bottom if a single member gets the German measles, unless they have been careful to practise with every member of the team in every place and to train at least one, and perhaps, two substitutes. It might even be well to practise with one or two men short, to allow for casualties. Formal training teaches the team to do the things that otherwise are forgotten; one of these is to summon the ambulance quickly, and another is to do good, careful clerical work. In the early days of the L.C.C. ambulances, complaints of delay were often made; usually it was found that no-one had summoned the ambulance. Careful clerical work saves endless trouble, even when it only means putting the surname first in block letters and entering the sex. It is a remarkable thing that if a couple have a surname that will also do for a given-name they will give a christian name to their progeny that will also do for a surname. The Smiths will name their children Bill or Bert; but an Anthony is likely to call his son Cyprian and his daughter Florence.

In the pamphlet Captain Knox does not take enough note of obstacles. In stretcher-drill the team should practise with a dummy at first, over every barrier that can be found; after that each member of the team should act in turn as the patient for such obstacles as gates, fences, ditches, or water-tanks. When advanced exercises are attempted, in which a stretcher has to be taken over a twelve-foot wall or from a second-story balcony, the dummy should come into his own again.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The annual elections of the college were held at the beginning of the month. Mr. Henry Stokes, senior surgeon to the Meath Hospital and vice-president since 1938, was elected to succeed Mr. William Doolin as president, and Mr. T. O. Graham succeeded as vice-president. Mr. Stokes is a grandson of William Stokes, the great Dublin physician, and Professor Boxwell, the present president of the Royal College of Physicians of Ireland, is another of his grandsons.